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MASSACHUSETTS AND ITS ECONOMIC MIGHT

THE POWER AND POTENTIAL OF CHANGE

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Corporation for Business, Work, and Learning

for the

Great and General Court of Massachusetts

February 26, 1998

Table of Contents

I. INTRODUCTION 4

II. THE NEW ECONOMY IN CONTEXT 8

III. WHITHER THE MASSACHUSETTS MIRACLE? 9

IV. THE MAKEOVER OF MANUFACTURING: THE MELTDOWN OF THE ASSEMBLY LINE 11

A. Staying Competitive by Modernizing the Small Manufacturing Shops 13

B. Preparing a Workforce for the Challenge 14

C. The Raising of the Bar: Basic Education Required 17

V. CLUSTERS OF SUCCESS: THE SYNERGIES OF A COMPLEX INDUSTRIAL BASE 18

VI. SOURCES OF STRENGTH: THE ENTERPRISE OF HIGHER EDUCATION 21

A. The Untapped Potential of a Community College Education 22

B. Higher Education and Economic Multipliers 24

C. The Real Payload: Academic Research and Technological Development 24

VII. CAPITAL MARKETS FUEL GROWTH 25

A. Venture Capital: Progress at Hand 25

B. Publicly Traded - Capital Success 26

C. Working Capital and the Power of Money 26

D. Employment in the Financial Services Sector 28

VIII. HOSPITALS WITHOUT WALLS: TRANSFORMATION IN HEALTH CARE EMPLOYMENT 29

IX. THE FISHING INDUSTRY: RELUCTANTLY CHARTING A NEW COURSE 30

X. ENTRY LEVEL EMPLOYMENT AVAILABLE IF 31

XI. THE DEMISE OF THE GUN BELT 34

A. Getting Firms the Help They Need 34

B. Communities Left with Less 36

C. Workers Put the Face on the Cost 37

XII. TRAINING: MAKING THE TRANSITION TO NEW WORK SETTINGS MANAGEABLE 38

A. Training the Incumbent: Good for the Employer, Good for the Employee 38

B. Rapid Response: Getting Help to Workers Before Their Work is Through 40

C. Training and Preparing Dislocated Workers for Times Ahead 40

XIII. WHAT THE FUTURE HOLDS **41**

XIV. THE POLICIES OF THE PAST FIVE YEARS **43**

A. Lowering the Cost of Doing Business in Massachusetts 44

B. Education Reform: A Substantial and Sound Investment 45

C.. Improving Workforce Development Efforts 48

D. Protecting the Massachusetts Manufacturing Base 49

E. Bringing the Expansion to All of the State 51

F. Welfare Reform 52

XV. RECOMMENDATIONS FOR FUTURE POLICIES: STEWARDSHIP AND INVESTMENT **54**

A. Increase the Investment in Skills At *All* Levels 54

B. Support Manufacturers' Deployment of Technology and Their Access to Capital 56

C. Promote Investment in Older Cities with Brownfield Liability Relief 57

D Continue Commitment to Education Reform; Support At-Risk Youth 58

XVI. CONCLUSION **59**

Appendix A: Summary of Massachusetts Rapid Response Efforts from July 1, 1995 to Present

Appendix B: Summary of Massachusetts Employment and Wages for 1987, 1988, and 1996 by Major Standard Industrial Classification Code

Appendix C: Summary of Massachusetts Gross State Product by Major Standard Industrial Classification Code for Years 1982 - 1996

CORPORATION
FOR BUSINESS,
WORK, AND LEARNING

The Schrafft Center, 529 Main Street, Boston, MA 02129
(617) 727-8158, Fax (617) 367-0211

February 26, 1998

Chairman Stanley C. Rosenberg
Committee on Ways and Means
Massachusetts Senate
Massachusetts State House
Boston, Massachusetts 02133

Chairman Paul R. Haley
Committee on Ways and Means
Massachusetts House of Representatives
Massachusetts State House
Boston, Massachusetts 02133

Chairman Rosenberg and Chairman Haley:

I am pleased to present to you a report on the Massachusetts economy entitled *Massachusetts and Its Economic Might,* which we have prepared pursuant to last year's state budget. The report discusses a number of trends in the current expanding economy and examines many of those trends in the context of programs administered by the Corporation for Business, Work, and Learning.

In particular, this report seeks to evaluate ways in which this economy benefits through its diversity and the ways in which various components of the economy work together. It also looks at how the economy's performance interacts with the current workforce and offers our best estimates on which parts of the economy will add workers and the characteristics workers will need to sustain economic growth. We have reviewed a wide variety of data and analytical sources to prepare this report, and we believe it provides a reasonably comprehensive analysis of the status of Massachusetts' firms, workers, and communities.

As is common among a number of analysts of the state's current economic conditions, we have used two primary frames of reference to evaluate Massachusetts' economic health. First, we have looked at conditions relative to the last years of the growth period of the 1980s. This period provides a pertinent frame of reference for understanding job growth, productivity, and overall makeup of the state's businesses. In order to make it possible for readers of this report to compare industrial performance over these periods, we have included two sets of tables as appendices. The first set of tables, published by the Massachusetts Division of Employment & Training, provides detail on the state's number of establishments and total number of employees and wages for the years 1987, 1988 and 1996 by major (two digit) Standard Industrial

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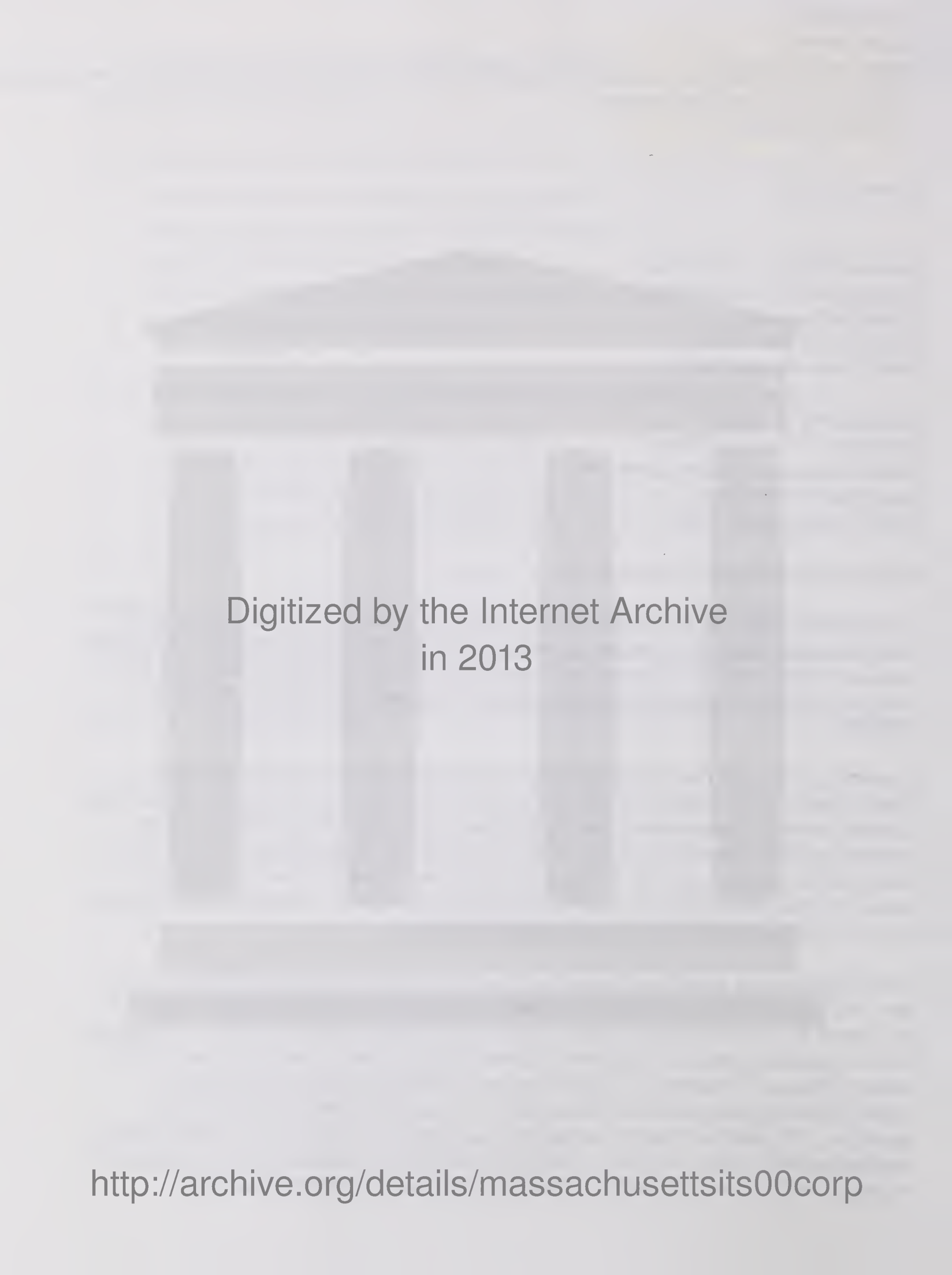
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Classification (SIC) codes. The second, which we created using data from the U.S. Department of Commerce, shows the gross state product for the major SIC codes from 1982 to 1994, the last year these numbers are available.

Our second tack was to evaluate Massachusetts' economic performance relative to states similar to us with respect to industrial composition and signficant reliance on highly skilled workers and concentration of high technology industries. The ability to make this comparison provided us with more useful and interesting analysis than simply comparing Massachusetts against national trends, which, of course, we also did as circumstances warranted.

The Massachusetts Office of Business Development (MOBD), which has been very helpful in preparing this report, is in the process of completing its own study on the state economy, including substantial sub-state analysis, which we expect to complement the report we submit today. We very much look forward to the MOBD study, as it will not only provide greater detail on regional and sectoral economic performance in general but will also provide us with a useful model for understanding how CBWL's programming can better serve the firms and workers of the state.

I hope that you will find *Massachusetts and Its Economic Might* useful and informative. If I can be of any assistance to you or your staffs, please do not hesitate to call me.

Sincerely yours,

Suzanne Teegarden

Suzanne Teegarden
President

MASSACHUSETTS AND ITS ECONOMIC MIGHT

I. INTRODUCTION

The Massachusetts economy is now in its seventy-eighth month of expansion, exceeding in duration, if not in scale, the growth period that began in January of 1982 and ended in April, 1988. Many aspects of the economy look very positive, showing no signs that this recovery is reaching its conclusion. Although the rate of growth as described in increased productivity, increased gross state product and increased number of jobs is somewhat modest relative to the last expansion, the apparent constancy of the positive signals creates new opportunities for policy makers and program providers. Among these are increasing the employability of disadvantaged and undereducated adults, encouraging investment in communities left out of the expansion, supporting the modernization of the industrial base, and ensuring that the goals of education reform are met and include all of our youth.

The current period has at least one obvious local threat: the unavailability of skilled workers in some high-growth sectors. This threat should prove difficult but not impossible to mitigate. Although a number of external threats - the continuing economic fallout in South Korea and southeastern Asia, persistent underperformance of the European economy, risky lending practices of some U.S. banks, the strength of the dollar, the expanding trade deficit, or the possibility of renewed conflict in the Middle East, which could threaten the current availability of low-cost fuel - are in evidence, they cannot reliably be predicted or even prepared for at the local level.

What is clear is that the current success, the pressures on certain parts of the labor market, and the uneven distribution of the gains in this expansion suggest the need for state and local actors to protect the future with stewardship and improve it with investment. Stewardship would come in the form of maintaining the gains made to date. In particular, the state should continue its efforts to (a) invest in the workforce; (b) maintain the government's fiscal stability; (c) support education reform as embodied in the Education Reform Act of 1993, including the school to work transition effort; and (d) assist the state's small and medium sized manufacturers through manufacturing extension and defense conversion programs.

State and local actors should *invest* in the future as well. Investment in certain specific and high need areas would yield a high return both to direct beneficiaries and to the overall economy as more citizens have a chance to participate in the American dream. These needs include fulfilling

the promise of welfare reform by supporting the acquisition of new skills and the availability of health insurance for those families now pursuing economic self-sufficiency; supporting investment in Massachusetts' older cities through brownfield development and other anti-blight, pro-growth programs; and making further inroads with at-risk youth through focused, organized and fully funded programming.

The stewardship and the investment that we recommend must be understood as intrinsic to the needs of the current economy, and to flow directly from changes that have taken place since the last expansion. These changes have created a set of challenges unprecedented in substance and scale and can be summed up in this way: Economic success now relies on the highest and best contributions of virtually all or our economic resources, for which workers need new skills and firms need new tools.

As the following discussion should make clear, Massachusetts seems to have made a mostly successful transition to what is sometimes described, as it will be here, as the "new economy". Its firms and the jobs they create rely like never before on a successful combination of high skills, access to capital, good planning and integration with the world economy. Like firms across the nation, the Massachusetts firms that have made this transition have done so in large measure by employing advances in software, telecommunications, and leading edge business services, three of the larger sources of recent growth in Massachusetts. Many firms are finding that they maintain market strength by responding to change almost immediately. The most successful identify and act upon the needs of a dynamic marketplace before those needs even materialize.

In the new economy, it may be fairly said that knowledge is the currency of the realm. Work has been organized to include a wider range of responsibilities for, and relationships with, the tasks within an enterprise. The Taylorist model of each worker performing a single function throughout a shift has all but disappeared. Contrasting with earlier periods, more and more workers are being charged with understanding their role in the company, looking for ways to improve and increase their contributions and communicating with co-workers, supervisors and customers. The firms that successfully adopt these strategies rely on ever increasing skills from their employees to implement them. These firms also demonstrate the irresistible force that investment in employee skills can bring to bear.

Similarly, investors and business service organizations find their opportunities -and therefore their responsibilities - to cut a much wider swathe in the marketplace. Without one sector dominating the landscape, and with the interreliance of so many products and services, workers throughout the economy, but particularly in the vital service sector, must stay attuned not simply to new products and new developments but to the pace of change itself.

For policy makers and program operators this creates new opportunities as well as new burdens.

For example, when workers are laid off through plant closings or downsizing, we have seen the difficulty of replacing their previous wages. But successful training programs prepare dislocated workers for work in new areas and with skills that help them stay attuned to change and to new opportunities. Such workers are thus positioned to participate in the economy for a longer period of time and with greater access to better jobs. Likewise, for disadvantaged adults and unskilled workers with weak or no work histories, training programs are quite effective at initiating their participation in the labor market. However, these workers will thrive only if they are able to acquire higher order skills along the way, either on the job or by continuing their education.

At the firm level, the numerous companies we have helped provide training to their workers have done so successfully when they not only update worker skills and seek to improve product quality and outcomes, but introduce workers to basic business issues like reading balance sheets, managing inventory and reducing overhead. Successful training helps workers develop and increase their skills on an ongoing basis *and* understand the market for a firm's products, the effective use of suppliers and inputs and how to identify business opportunities in and out of the firm.

This new dimension to the economy, in which individual and corporate roles and responsibilities have transcended the "vertical" boundaries of firm hierarchies and the "horizontal" boundaries of corporate and sectoral borders, pushes the role of an agency like CBWL - and indeed many others in the state as well- in new and exciting ways. Firms and employees need more than simple crisis management for layoffs, defense cutbacks, or lack of access to capital. Families and neighborhoods facing poverty, school failings and dropouts, or blight need more than dead end jobs, GEDs and short term help. The new economy both demands and rewards more focused and concerted efforts to help individuals and firms succeed. Workers need to be prepared not only for the next job, but for a series of opportunities. Firms need to position themselves to compete globally and with deeper understanding of the competition and of their markets. And youth need not only a diploma or its equivalent but the tools and the support that will allow them to embark on a lifetime of learning.

In the ensuing discussion, we will examine the current economy, how it has matured, how it is different from the previous expansion and some of its strengths and weaknesses. We will follow this with a review of how CBWL and some other program providers are responding to the challenges that remain and a series of recommendations that policy makers and other readers might consider. We will look at particular sectors that have made important contributions to the current period, such as telecommunications and financial services, and others that have been mainstays for workers for generations, such as manufacturing and health care. We will also examine the role of the defense industry, which, following the end of the Cold War in 1991, has undergone substantial transformation and continues to evolve in response to changes in Department of Defense procurement strategies.

Of necessity, this report is limited in scope by space and resource constraints. For this reason, we have focused on those aspects of the economy that have changed most dramatically in the past fifteen to twenty years, either as measured by overall employment patterns or by virtue of their relationship to the economy overall. We have also sought to focus on those areas of the state's economy that most relate to CBWL's sphere of activity. Thus, we have reviewed in some detail the state of the Massachusetts manufacturing base, including employment patterns, need for skills, access to state of the market technology, and access to capital. The detail reflects the significant changes that have occurred in employment patterns and overall economic performance, as well as our mission to understand and assist this sector in meeting the challenges of the new economy. In keeping with our services to individuals facing job loss and entrance into the labor markets, we have also reviewed some of the changes that have faced the health care industry, the fishing industry, and some of the leading edge industrial sectors, as well as entry level employment generally. We also look at some of the weaknesses in the current labor market and how those weaknesses might be addressed. CBWL also maintains a focus on preparing youth for the challenges before them, which includes work with program providers to at-risk youth, community-based education reform, and school to work programs. Thus, we describe some of those programs and the need for them in this economy.

Finally, in an effort to create a more complete picture of how this economy functions, we sought to illustrate the complex and intricately woven roles that many of the state's economic drivers play. We live in a state with substantial numbers of highly educated workers, world class economic resources, a concentrated manufacturing base and an increasingly diverse population. The discussion of the role played by higher education, financial services and publicly sponsored research serves to provide insight as to how various roles play out in providing economic opportunity for everyone. At the other end of the spectrum, we note that despite the economy's success of late, the incidence and intensity of poverty appears to have increased. We are hopeful that a deeper understanding of the basis for our economic success and an awareness of this conspicuous gap leads to a stronger effort to assist those families who have been left out of the recovery.

This report is respectfully prepared for the Massachusetts Great and General Court, and the conclusions and observations are solely those of the Corporation of Business, Work, and Learning and may not reflect those of the other organizations and agencies cited in this report. This report is also less a comprehensive outline on every feature of the state's economy than a working guide to some of the issues we consider important to the state's economic progress and some observations on how those issues can be successfully addressed.

None of the work that has gone into preparing this report could have taken place without substantial contributions from a number of sources. We are grateful for the help of the Massachusetts Office of Business Development, the Massachusetts Technology Collaborative, the Massachusetts Department of Economic Development, the Massachusetts Division of

Employment and Training, the New England Board of Higher Education, the Massachusetts Department of Education, the Massachusetts Board of Higher Education, the Massachusetts Taxpayers Foundation, the Center for Labor Market Studies at Northeastern University, the Massachusetts Institute for a New Commonwealth, the Associated Industries of Massachusetts, the Small Business Association of New England, the Association of Independent Colleges and Universities in Massachusetts, the Donahue Institute at the University of Massachusetts, the Adult Literacy Resources Institute, and the resources of the U.S. Department of Commerce, including the Census Bureau and the Bureau of Economic Analysis.

II. The New Economy in Context

Almost since its founding as a colony, Massachusetts has used its best assets to great advantage, sometimes overcoming more obvious disadvantages. The early colonists exploited some of the best natural harbors on the western edge of the Atlantic for fishing, whaling and trade; later citizens would marshal capital and labor into first commerce and then manufacture, allowing the state to dominate in a long list of endeavors, including trade, finance, shipbuilding, textile and apparels, shoemaking and leather, machining and metal industries, health care and science, and computers and telecommunications. Not incidentally, our heritage also includes leading numerous revolutions, political and industrial, throughout the nation's history.

It is difficult to overstate the great gifts that its people's genius, vigor and tenacity have bestowed on our state or to gainsay the contributions of so many inspired individuals. Throughout its history, Massachusetts has thrived not by the accidents of fate and fortune, but by the deliberate acts of men and women who met the challenges before them with insight and with granite. We are home to the nation's first university, first public library, first public high school, and its first free public grade school. Our state constitution and the local town meeting are founding institutions of the modern democracy, and our universities set the standard by which others are measured. Here, factories shod and clothed a nation, armed a military and revolutionized communications. And here came the first telephone, sewing machine, digital computer and oral contraceptive. Our forbears envisioned change and seized opportunity, and they did so with profit and posterity in mind. The underpinnings of the modern economy are an amalgamation of the foresight and talent of Massachusetts' Pantheon of politicians, scholars, benefactors and industrialists, who in turn engaged and relied on the enterprise and fortitude of millions and millions of average men and women. Together they hammered, forged and stitched together an economic system that today provides jobs to more than 3.1 million workers, creates almost $200 billion in wealth a year, and brings prosperity to an extraordinarily large number of the Commonwealth's six million residents.

It is in this tradition that CBWL, in concert with our partners in state and local government and in the private sector, endeavor to help, guide and nourish Massachusetts' firms and families as they seek their own fortunes. For while we are the heirs to a remarkable legacy, our economy

must be understood as a continuing and dynamic creation that has promise unmet as well as fulfilled.

Our mission is to fulfill a greater amount of the promise that the economy holds for a greater number of people. We remain mindful of the many who are left behind and who must overcome barriers to secure economic self-sufficiency. We note the fact that firms cannot grow efficiently or conserve their competitive edge because of insufficient numbers of trained workers. A great source of our economy's strength, the small manufacturing firms, need better access to the marketplace of technology, capital and commerce in order to compete. Workers continue to be displaced and need vital information and training resources; and the poor and uneducated need skills and opportunities to gain their footing on the playing field. Our responsibility is to help those least able to prosper and to work with others like us to combine the effort, imagination and resources into solutions that meet their needs.

III. WHITHER THE MASSACHUSETTS MIRACLE?

If the great history of Massachusetts serves as a backdrop to understanding how the variable forces of will, innovation and enterprise build a successful economy over time, the growth period of the '80s - the "Massachusetts Miracle" - provides many of the values for measuring the success and perhaps the future of the current period. As noted above, the present expansion is now on track to outlast the so-called Miracle years. Unemployment is currently less than 4%; inflation is hovering around 2% and wages are keeping pace plus some fairly modest gains of 2.4%. Growth is steady at 2.5%, and private investment is moderately high. In contrast, the Miracle years saw unemployment lows of 2.7%; inflation climbed to over 6%. Growth peaked at a spectacular 6.7%, and private investment, including venture capital, leveraged buyouts, and real estate speculation, was - perhaps now notoriously so - unprecedented.

The current expanding economy is nevertheless remarkable in a number of ways, some of which appear to be unique, or at least historically unusual, and nearly all which differ from the Miracle years. In its inaugural issue, the editorial board of *Massachusetts Benchmarks*, a quarterly review of the Massachusetts economy published jointly by the University of Massachusetts and the Federal Reserve Bank of Boston, came to something of a consensus on how to characterize the current economy. They make these nine observations:

- This economy is diverse and made up of a broad range of activities, in contrast to the Miracle years which were fueled by minicomputers, defense expansion and real estate speculation;

- Massachusetts' economic expansion is relatively even with the national economy, with virtually none of the imbalances of the '80s;

- Labor force participation exceeds 80%, a historically very large rate, putting upward pressure on wages and threatening economic growth, unless new immigrants and welfare recipients can help meet the demand for new workers;

- Given that labor markets are tight around the country, Massachusetts firms looking to meet labor needs have few opportunities in the U.S. for relocation;

- An increase in debt, personal bankruptcies and riskier consumer lending patterns on the part of banks are increasing, although not approaching the scale of the Miracle years;

- The benefits of the expansion are not being realized at the low end of the labor market, and wages in general are not increasing;

- The housing market has "heated up", but not on a speculative basis, and, because of the increased use of secondary markets, not at great risk to lenders;

- The comparatively low number of job advertisements may reflect a more efficient labor market and more accurate sorting of workers into appropriate jobs; and

- The presumed relationship between inflation and unemployment, in which a lower rate of unemployment produces a higher rate of inflation, is being challenged by current patterns, and may have shifted.

Thus, the present economic growth period generally appears to be based on more solid, diverse and nationally integrated elements than were the Miracle years, and, while lacking in the intensity of some factors, perhaps more able to sustain itself. However, we are reminded of the predictions made late in 1987, which prophesied that the Massachusetts Miracle was self-sustaining and would likely continue for years to come.

In truth, we can see that much of the strength of the current recovery and the weaknesses of the preceding recession were related to events taking place in the economy of the Miracle years. For as we look more closely, a realignment of the economy seems to have occurred in which new tools allow firms to move more quickly and more efficiently in the marketplace. It now appears that many of the strengths and challenges we see today were embedded in the increasing emphasis on quality, knowledge and skills that began to take hold in the early to mid '80s. Indeed, the strong growth years masked many of the transformations and associated difficulties that manufacturers and other value-added sectors experienced in the '80s. Those companies that responded aggressively to those changes tended to survive. Their success in the market today is a function of their ability to adapt to the rigors of change.

The Massachusetts Miracle is generally regarded as having been fueled by the growth of the mini-computer industry, a substantial increase in defense procurement, and later, real estate speculation; when these three factors almost simultaneously collapsed toward the end of the decade, the Miracle years ruptured into the recession of the 1988-1993. However, even as the growth and prosperity of the '80s wore on, significant changes were taking place in the workplace and in the larger economy that were not only undermining the so-called Miracle -for example, laying off workers, and moving production to lower cost facilities, and shedding internal capacity- but were reorganizing the way in which companies produced goods, employed workers, and behaved in the market. The world of work had begun to change in the '80s, and neither the full effects nor the end of these changes have completely materialized.

IV. The Makeover of Manufacturing: The Meltdown of the Assembly Line

As the Miracle years raged in the mid to late '80s, the manufacturing sector in general was shedding employees by the tens of thousands. Production workers, skilled and unskilled, middle management, and support staff all saw their jobs disappear. Although the defense build-up benefitted a number of firms, primarily those that produced high technology goods, many more found themselves unable to continue to sustain their employment base as automation, overseas competition and input costs increased. Also changing employment patterns were the innovations taking place on the shop floor.

As firms faced the increasingly exacting demands of their customers and as production innovations made possible by computers, automation and various quality assurance methods took hold, many firms found the skills of their workers obsolete. Firms closed their doors, and production facilities were removed to other parts of the country or overseas in pursuit of cheaper labor and other inputs.

Total manufacturing employment in Massachusetts saw reductions of over a third in the space of the last ten years, and both work and capital have moved overseas to take advantage of global markets and lower costs of energy and labor. Nevertheless, manufacturing continues to be a cornerstone to the well-being of the Massachusetts economy. The firms and product lines that remain support industries in sectors and markets throughout the nation and are increasingly integrated into the world economy.

From the smallest machine shop to the large original equipment manufacturers (OEMs), the radical restructuring of economic relationships and of the workplace itself has affected the gamut of firms. Staying competitive demands adopting communication and computer based technologies, assigning multiple job responsibilities to workers and requiring constant skill updates from workers. These changes have shifted the types of firms that make up the Massachusetts economy, rewarding higher-end producers, especially of durable goods such as

instruments, plastics and electronics, and creating a new role for smaller producers who can keep costs down and quality high. Scrap, rework, and employee turnover add strain to companies trying to keep pace, however. For as a significant number of the OEMs rely on local small shops to fill specific needs in their production schedules, these smaller firms must compete on the terms set by their customer base.

This kind of intensive and interactive relationship with the customer is in keeping with the trend begun in the mid to late '80s, when larger firms turned away from the trend of conglomeration and began to eliminate the overhead costs associated with internalizing all production. This practice in turn led to closing parts of their plants and outsourcing work.

Firms in Massachusetts have responded to the demand for higher quality at lower costs with increasing, but varied success. Since 1977, manufacturing productivity has increased by over 180%. In 1982, 650,000 workers produced manufactured goods worth $23.782 billion in inflation adjusted dollars. In 1994, 450,000 workers produced goods valued at $30.207 billion. These gains belie the myth that manufacturing is an industry in decline. The true story is that fewer workers are making better and more valuable products. The true story is that Massachusetts and its surviving manufacturing base supports distinct competitive advantages over producers in other regions. This competitive edge can be protected and nurtured.

We see a great deal of potential for increasing these productivity gains by providing manufacturing extension services, programs designed to increase the utilization of technological advances, to small and medium sized firms. Small firms of fewer than 50 workers continue to characterize the Massachusetts firm, making up 81.4% of firms (over 7,520) and employing 20% of the workers. An additional 30% of the manufacturing labor force work for firms of 50-250 employees, which constitute approximately 15% (1,390) of the firms. These firms have been among the hardest hit by the transformation in the market for their goods, and they cannot survive without pursuing productivity enhancing strategies to complete the transition to the new economy. Although small firms are only likely to do be able to do this with some external support, they have little choice.

Throughout the manufacturing industry, the demand for high quality, lower costs, close tolerances and quick turnaround continues unabated. For example, the suppliers to the big three automobile manufacturers must maintain quality certification known as QS9000. In addition to the intensive review of production flows, quality maintenance and worker skills this requires of the OEMs, each of the hundreds of smaller firms that produce parts and materials for these prime suppliers must adhere to the same standards. Even if certification is not required of the smaller firm -which it generally is- each firm must satisfy the needs of the OEM's quality assurance program. Similar demands are typically placed on suppliers to the aerospace, medical device, electronics and computer hardware OEMs.

These new regimes, either imposed by the customer or adopted as competitive strategy, are evident in virtually every part of manufacturing in the state and have raised the stakes for small firms, without increasing the resources they have to satisfy the market's new demands. Compounding this issue, firms face an even more immediate challenge: the need for skilled labor.

As discussed in more detail below, manufacturing firms are increasingly experiencing difficulty finding skilled workers. Large numbers of workers left the state in the sustained job losses of the late eighties and early nineties, and fewer and fewer young people acquired the skills needed for successful careers with manufacturing firms. In fact, the level of skills employers need has increased. A competitive manufacturer needs a workforce that is numerically and English literate, able to solve problems and communicate with customers, supervisors and co-workers, and function in an automated environment. This skill level greatly exceeds that required for similar work less than twenty years ago. As one employer put it, "This is not your father's old machine shop".

The need for skilled labor and to adapt to the challenges of the new economy is not incidental to the larger economy's viability. Despite setbacks and a shifting economy, manufacturing continues to be a dominant force in the Massachusetts economy, accounting for about 15% of the state workforce (449,000), and almost 17% of the GSP, with a national stronghold in the high wage durable goods sectors of machinery, instruments and electronics, among others.

Massachusetts cannot afford to neglect this sector. Wages are higher in manufacturing than in other sectors, particularly for those with higher skills or education, and significantly higher in those manufacturing sectors producing the newest technologies, such as telecommunications and instrumentation equipment. Manufacturing also accounts for a large portion of wealth creation in Massachusetts, selling much more of its goods outside of the state than within and forming the basis for significant amounts of other economic activity.

The core sector of manufacturing is healthier than it was ten years ago but not as strong as it can or should be. The threat to manufacturing's continued competitiveness persists in two forms. First, small and medium sized firms are not taking sufficient advantage of technological and methodological advances in production, ultimately leaving them less competitive in the marketplace. Second, workers are behind in the skills and education needed to succeed in the modern workplace, placing them and their employers at a competitive disadvantage.

A. Staying Competitive by Modernizing the Small Manufacturing Shops

Small and medium sized firms, which have the least amount of internal resources, must continue to adapt to the changes that have already taken place and stay apace of new changes as they

occur. Unfortunately, that has not been the case: According to the U.S. Department of Commerce, manufacturing productivity in Massachusetts, the difference between a product's value and the cost of producing it, lags behind that of the U.S. in every sector save textiles and apparel. While manufacturers throughout the nation -including Massachusetts- have increased value added through innovation, capital investment and human talent, our firms are not keeping up with the U.S. competition.

Failure to keep pace with the best performers of an industry means not only that money is left on the table, but that our ability to compete effectively will not be sustained. For although the changes in the workplace in general have provided important gains in productivity, product development and return on capital, many of the smaller firms are not adopting the strategies at a pace that will enable us to sustain our competitiveness and thus our place nationally. Alternatively, if the contributions of the smaller sized firms to the stream of commerce are cultivated and nurtured by ensuring their access to new developments in the workplace, the promise of this post-industrial revolution will be fulfilled.

The marketplace offers further evidence of our competitive deficiencies. The total value of goods exported to foreign markets has declined relative to that of the rest of the nation. According to the Office of Trade and Economic Analysis at the U.S. Department of Commerce (as cited in a recent report from the Massachusetts Technology Collaborative), manufacturing exports from Massachusetts have grown by 21% in inflation adjusted terms between 1991 and 1996, from $9.5 billion to $11.5 billion, while the national rate of growth has increased by 31%. Plainly, the foreign markets for U.S. goods are expanding dramatically. Certain states, including Illinois, California, Florida and Texas, are exploiting these opportunities and posting strong gains in those expanding markets, building market share, increasing and improving their relationships with foreign companies and buyers, and building their expertise.

From Massachusetts, the industries with the largest share of exported goods are industrial machinery and computers, electronic and electric equipment, and instruments and related products. Note that these producers emphasize high technology and high value added production techniques, and that a majority of the firms in these sectors are small and medium sized manufacturers. This suggests that we can realistically and economically improve our performance in the international markets by ensuring that the small and medium sized producers of these types of goods and their supply base successfully deploy the production technologies and methodologies that will make them competitive with their counterparts in other states.

B. Preparing a Workforce for the Challenge of Change

The second and very much related threat to the manufacturing sector is the availability and skills of the workers themselves. Throughout the state we have seen that the inability of firms to hire

employees for production and other value-added work in the manufacturing sector is limiting their growth and ability to increase productivity. The Massachusetts Taxpayers Foundation has released a report that predicts overall employment growth in the state economy of 1.9% in the next few quarters, subject to one qualification: a substantial number of firms will find their growth limited by unavailability of skilled workers.

The current labor market, in which we are seeing over 80% labor participation rate and only 4% unemployment is unquestionably a factor. The Associated Industries of Massachusetts also reports that the third quarter of 1997 saw an increase in 1600 manufacturing jobs, for a total of 5,150 in the past four quarters. Welcome growth to be sure, but further tightening in the labor market.

Manufacturers face other labor market pressures as well. For one, individuals entering the workforce are opting away from the manufacturing sector, in favor of other opportunities. These individuals tend to identify manufacturing as a declining sector with decreasing opportunities. In the past fifteen years, manufacturing workers, their children and their communities have witnessed the layoffs, downsizing and outsourcing that have resulted from changing markets and restructuring the workplace. Tens of thousands of these workers left the state altogether. Much of the skilled labor that has remained has now begun to retire from the workforce. Despite recent stabilization in the sector, gains in the number of jobs, and substantial opportunities for advancement, young workers are not attracted to this sector and are not preparing themselves for the work it offers. A public education campaign focusing on career options in manufacturing may be necessary to help change the attitudes of parents and young adults in making career choices. Manufacturers and manufacturing associations may find it profitable to develop partnerships with vocational high schools to expose students to the range of career options in the manufacturing sector.

The preparations are not years of college. Of the 449,000 workers employed in the manufacturing-based sector, 53% are in production and precision production, a diverse group that includes machine operators and setters, mechanics, installers, assemblers, material handlers, machinists and supervisors. These workers, while skilled, do not require college degrees, and most of the training for these positions takes place on the job or in short, certificate programs. Indeed, 27% of manufacturing positions require only a high school diploma, basic skills and the ability to learn on the job. Note, however, that the number of jobs requiring only a high school diploma is lower in manufacturing than in the economy as a whole (which is about 33%), reflecting the premium manufacturers place on higher level skills.

The backbone of manufacturing is machining and toolmaking, activities that are part of almost all manufactured goods at some point. The many employers who use machining processes need people who like to work with their hands, can communicate well, and can perform high school level math. Additional short term preparatory instruction would include metrology, blueprint

reading and introduction to the machines and automation in the shops. Despite the large numbers of positions created by the retirement of current workers and by the resurgence of the sector's economic activity of late, however, employers cannot find the workers. Nationally the problem is no less urgent. The National Tooling and Machining Association reports that this phenomenon is occurring all around the country, reporting current demand for workers at about 20,000 nationally and about 1,000 in Massachusetts. Locally, this raises the serious concern that the existing talent pool will be enticed to move to jobs in other states. For workers who stay and acquire high level skills, they can almost write their own tickets. Enterprising precision workers in manufacturing can earn upwards of $70,000 a year.

Notwithstanding recent strength and hiring crunches, the Division of Employment and Training reports that automation, global competition and other factors will force manufacturers to reduce the total number of manufacturing jobs by 12% -from 449,000 to 393,000-, with disproportionate losses at the lowest skill level. Replacement needs for workers who retire, relocate or leave the workforce will nevertheless result in 104,000 new job openings. Within that set of openings, more will be with manufacturers with products relying on higher technology and skilled production and fewer with low-skilled production or high levels of automation. Thus, employers will reward the ability and initiative it takes to acquire higher level skills.

The shift to higher level skills at the entry level is inevitable. Due to the high costs of inputs in Massachusetts, such as energy, real estate, insurance and labor, firms that do not become highly productive in their use of those inputs by adding commensurately high value, including highly productive production workers, will simply leave or close. These firms must have skilled workers, which means they must know how to train their incumbent workforce, while also having access to young adults with good basic skills and a desire to learn. Small and medium sized firms, which often lack human resource personnel, report difficulty identifying the multiple training needs of their front-line workers and salaried employees. This compounds the secondary challenge of knowing how to select the most effective training providers to meet these needs.

Unfortunately, the public sector's training capacity for manufacturing related employment, particularly in the traditional machine shops, has suffered deep cuts and declined significantly, most notably at secondary level vocational technical schools. While these cutbacks can be understood as a reflection of fewer openings and lower enrollment, which began ten years ago, the disinvestment that occurred as a result have left only a handful of the state's voc-tech schools with tooling and machining training facilities, and virtually none in Greater Boston. Nor have the voc-tech schools been able to maintain state of the market equipment. Unfortunately, the costs of re-establishing that capacity are almost prohibitive, and thus will probably require innovative solutions that engage the private sector at the firm level.

Of course, the private sector training capacity has also declined in recent years. For the larger

firms, including General Electric and others, the move toward downsizing internal structures and outsourcing production has led to eliminating the apprenticeship programs that acted as feeders for their production lines. At the smaller and medium sized firms, the need to meet tighter schedules, set up machines quickly and accurately, virtually eliminate scrap, and satisfy closer tolerances has reduced the time available for experienced workers to transfer knowledge to novices. Private institutions, such as Boston's Wentworth Institute of Technology, have also witnessed lower enrollment and reduced capacity accordingly.

Whether or not the years ahead will see manufacturers continue to cut jobs overall -the DET's labor market analyses predict a net loss of twelve percent by 2005- or stabilize and begin to add jobs as some industry observers continue to hope, the progress in productivity and required worker skills must increase in order for these firms to stay in business. For that to happen the workers must have an opportunity to increase their skills and abilities. They also must have good basic skills.

C. The Raising of the Bar: Basic Education Required

It is axiomatic that workers with better skills receive better compensation. As a worker's productivity increases, employers are prepared to pay higher wages to attract or retain the individual worker. The ability of an employer to compete nationally and globally is predicated on the availability of that worker whose productivity can increase the value added to a product or service.

Employers reasonably expect that a candidate with a high school diploma will possess high school-level-proficiency in math and English. These basic skills are fundamental to an employee's productivity in the workplace and the ability to learn on the job. However, as the Massachusetts Department of Education reports, using U.S. Census data, almost 2 million Massachusetts adults, or 44% of the adult population, lack these basic skills. The Department of Education further reports that 877,000 Massachusetts adults, or 20%, cannot read beyond a fifth grade level.

This kind of skills deficit might not have serious effects on productivity for manufacturers and other firms in a Taylorist, unautomated, assembly line environment. But those companies are not the future of this economy. As the discussion below of the leading industry clusters suggests, the Commonwealth's ability to continue to offer prosperity to its citizens relies on the competitiveness of its employers who in turn rely on the availability of a trained and educated workforce.

Much training and education occurs through employers or is self-invested by the worker. The public sector also plays a critical role, of course, both in preparing workers through high school,

and in supporting and developing the adult basic education, post-secondary and job-training resources that will lead the economy forward. Second to providing quality K-12 education across the board, the most urgent existing need is to help the adults who need basic skills to become or remain employable.

The Department of Education's current capacity pales in comparison to the existing needs. The DoE's adult basic education programs enroll about 20,000 adults a year, for a cost of $18.3 million. In FY '98, spending will increase to $27.5 million and will serve about 23,000. But some 15,000 people are on waiting lists, and individuals are known to wait for up to three years to enroll in a slot. Particularly in cities with large immigrant populations, the demand for services far exceeds the capacity, i.e., the funding available, to deliver them.

The population of Massachusetts is not expected to grow much in the years ahead. To the extent it does, it will grow primarily as a result of new foreign immigrants. This population cannot fulfill their potential in the workplace without having adequate English and basic skills. Of course, the vast majority of the two million adults in need of remedial education are not immigrants. They are, however, a substantial portion of the current workforce.

The issues facing our manufacturers are not unique to them. As we will see, virtually every major industry in the state faces the need to hire workers with at least high school level abilities who arrive at the worksite prepared to meet the challenges at hand.

As the nursery rhyme teaches, for want of a nail, the rider and battle were lost. If the training system is not preparing the worker, the worker will not be there to play his part, and the customer will fill her order elsewhere. The worker will not be at the machine or the computer terminal helping to fill that order unless the firms, the training and education providers, and the requisite resources are working together to recruit, train and meet the need for increasingly skilled employees.

V. Clusters of Success: The Synergies of a Complex Industrial Base

Massachusetts' manufacturers produce the nation's sixth largest output of goods and products, creating enormous amounts of wealth and creating synergies with many aspects of its vibrant service sector. Indeed, one of the great strengths of the current expansion is its diversity. In the leading industries of plastics, software, and medical technologies, among others, regional strength is fueled by proximity to other clusters, including a strong financial services sector, higher education institutions and their research endeavors, and a leading edge health care sector. Each of these, themselves important contributors to Massachusetts' economic strength, in turn relies on an educated and productive workforce. The core asset of the economy, which will not move, cannot be replaced and must not be neglected, is the skills and knowledge of its workers.

The variety of this economy and the overlap in the skill sets it employs supplies opportunity for employment and advancement to virtually all of its workers, subject to individual education, ambition and the ability and opportunity to acquire the skills employers seek. As workers take advantage of cross-sector opportunities, the admixture encourages and facilitates the spread of knowledge and innovation throughout the economy. Given the expected stability of the state's population, with only modest growth, this interaction and the benefits it confers should only increase.

For policy makers and program providers the increasingly transient nature of employment and the opportunity for cross-sector fertilization presents a rare opening to unlock the potential of the state's workers and, in doing so, secure the single most reliable and equitable way to increase the output of its firms. Public resources dedicated to raising the education and skills of Massachusetts residents increases the value of one of the most permanent assets of the economy and creates increasing gains over time, even across generations. Whereas the state's economic growth appears to be limited by lack of skilled workers for new positions, the extent to which public policy can close that gap by increasing worker skills will directly benefit both the firms and their workers. Renewed commitment to skills can serve as a catalyst for economic and social progress.

The diversity of this economy rests on a number of clusters that have concentrated in Massachusetts and which also offer workers relatively high salaries. These clusters, which the Massachusetts Technology Collaborative has devised using disaggregated four digit SIC codes, identify industrial sectors that bear a relationship to one another, have employment concentrations higher than the national average, pay wages higher than the state average, and support a high absolute number of establishments. The clusters include

- software and communication services;
- textiles and apparel;
- healthcare technology;
- diversified industrial support (e.g., plastics, industrial machinery and controls, machine tools and accessories, metal coating, abrasive products, lubricating oils);
- defense;
- computers and communications hardware;
- financial services;
- innovation services (e.g., engineering services, commercial research, management consulting services, testing laboratories); and
- post-secondary education.

The sheer number of these sectors limit over-reliance on any one sector for our continued economic vitality (although all remain vulnerable to macro-level disruptions), and the interrelatedness of many of these individual industries also adds strength to the whole by

fostering innovation across sectors. We should expect this industrial diversity to shield the economy from the effects of wide swings in performance in particular industries as well as help absorb workers dislocated through company layoffs or sectoral downturns.

The quality of the sectors is also noteworthy, featuring, as it does, mostly high-end producers of both goods and services. But beneath the quality of the dominant sectors steps the Achilles' Heel to this economy: We are only as strong as the skills and abilities of our workers, and no sector will meet the challenges of the marketplace without a skilled set of employees. Conversely, effective cross-sector mobility relies upon the skills of workers to be able to adapt to new industrial sectors, and, in doing so, they bring with them skills, fresh ideas and energy.

We have concrete evidence of diversity as an agent of innovation. The telecommunications industry, which is a hybrid of services and manufacturing, has taken root here through the convergence of several strong industry clusters, most notably software and communications and computer and communications hardware as well as consulting services and diversified industrial support. This serendipitous combination of industrial force has produced a brand new industry. Telecommunications is now a high growth, high wage sector, adding 34,465 workers since 1993 for a total of almost 100,000, and increasing sales by 290% over the same period. Moreover, the market for its products and services is predominantly exclusively other businesses, suggesting that it will continue to grow and create new products as the needs of its customers mature.

The emergence of the telecommunications industry illustrates how the strength - indeed the very presence - of these clusters is linked to the concentration of educated and skilled workers. Industrial innovations and the ability of firms to capitalize on new product niches and cross-fertilization is a function of worker skills moving across industrial sectors and bringing ideas and talent along them. This can create an upward cycle in productivity for employers, as they adopt practices developed elsewhere and adapt them to suit the needs of the particular firm. The growth and prosperity that this process fosters in turn increases the state's reliance on a skilled and educated workforce.

Not surprisingly, the employers and industrial sectors most likely to benefit from this type of synergistic cross-fertilization are the leading stars of the economic firmament. Massachusetts' leading industries employ over 600,000 workers in the state or 24% of the non-government workforce, and, with the exceptions of the defense cluster, the textiles and apparel cluster, and the computer hardware cluster, all have added jobs in the past five years. Some, such as the financial services cluster, software cluster, and the innovations services cluster, have added substantially higher than average numbers of new jobs. The service oriented clusters such as software and communications, financial services, post-secondary education and industrial support functions have added over 48,000 new jobs since 1992.

These clusters also pay much higher than average wages. The average wage of workers in

leading industry clusters exceeds $52,000 a year, compared with the US average salary of $27,441 and the Massachusetts average of $33,940. Workers in these sectors have also increased their salaries by larger percentages. Overall, salaries for these workers have increased by 6% in inflation adjusted terms over the past five years, outperforming the nationwide average of 2.2%, as well as the average of the six Leading Technology States of 2.3%.

The clusters that include manufacturing, particularly computer hardware, diversified industrial services, textiles and apparel, and defense have contracted overall, and continue to undergo change and restructuring. Defense has contracted by almost 9% annually since 1990 for a total of over 15,000 jobs. Computer hardware has contracted by 7% annually since 1990 for a total of over 15,000 jobs lost. The Division of Employment and Training expects the net loss of jobs to continue in the years ahead, although at a less dramatic rate than the past ten years. We reserve some guarded optimism, however: As noted above, manufacturers overall (including some sectors not part of these clusters) have added jobs in the past four quarters.

VI. Sources of Strength: The Enterprise of Higher Education

Overall, and despite educational deficiencies noted above, much of our workforce is generally better educated than most states against which we compete, reflecting a combination of factors, including lower high school dropout rates, higher than average enrollment in post-secondary education and a general cultural emphasis on educational attainment. Indeed, while the Department of Education notes the lack of basic English and math skills for 44% of Massachusetts adults, that figure is at 50% nationally.

The Massachusetts Technology Collaborative recently compared Massachusetts against six states it selected as similar to Massachusetts in industrial composition, employment, wages, and concentration of workers. Six states -New York, New Jersey, California, Texas, Illinois and Florida- were identified by the MTC as Leading Technology States (LTS). Among these, Massachusetts outperformed the group in a number of educational indicators.

Massachusetts leads in the percentage of individuals who have completed high school, with only 14% having failed to reach that milestone, compared with an average of 19% in the LTS. In the past five years, an average of less than 4% of our high school students fail to return to school each year for reasons other than transfer. In 1993, the most recent year that state-to-state comparisons are available, 3.5% of students did not return to school compared with 5.1% in California and 4.3% in Texas. Note, however, that some rural and urban districts have much more ominous figures. For example, in 1996, twelve schools in central Boston had drop out rates in excess of 10.1%. At that rate, substantially more than 30% of these students will not earn a high school diploma.

Massachusetts also boasts a higher percentage of college graduates than the six Leading Technology States, with fully 33% of its workforce having earned at least a baccalaureate, compared with only 25% in the LTS. Massachusetts is also home to a disproportionately large number of Ph.Ds. Over 15,000 Massachusetts workers have Ph.D.s in the hard sciences, with equal shares going to the life sciences, the physical sciences, and computer, math and engineering.

The news on our college graduates is not all good, however. The number of engineering degrees awarded by Massachusetts institutions has decreased at a rate substantially higher than the national average. Between the years of 1987 and 1996, the number of undergraduate degrees awarded in engineering declined by 35% compared to a national average of 14%. This decline is cause for concern among the high-technology employers since they rely disproportionately on a pool of new engineers to develop, test and implement innovations in their fields.

At the graduate level, science and engineering degrees awarded by Massachusetts schools increased by 14% over the same period. However, again Massachusetts lagged behind the country, as the number of science and engineering graduate degrees at the national level increased by 33%. In 1996, Massachusetts institutions had approximately 23,050 students enrolled as candidates for graduate degrees in science and engineering.

Those students who do attend and graduate from Massachusetts institutions of higher education generally stay in Massachusetts for a significant part of their working lives. A plurality of both students receiving engineering degrees (42%) and students awarded Ph.D.s (33%) in the last ten years were working in Massachusetts in 1995. In 1994, Massachusetts' ninety public and private four year institutions awarded 42,351 bachelor's degrees, 20,745 master's degrees and 2,228 doctoral degrees. Its twenty-eight public and private two year colleges conferred 13,084 associate degrees, most of which are vocationally oriented and, subject to the following qualifications, publicly supported.

A. The Untapped Potential of a Community College Education

While we know that our premier institutions attract resources and talent from around the world, our community colleges play a different role. These schools meet the needs of ambitious individuals who come from less economically advantaged backgrounds. They serve more minorities, immigrants and first generation citizens than do their private school counterparts, as well as college age students whose parents are not college educated. Increasingly, they are serving older students seeking to advance in the workplace.

Both historically and currently, Massachusetts dramatically underperforms the nation with respect to supporting education at the community college level, with predictable results. Perhaps

as a result of the wealth of private institutions, state funding for higher education is less than half of the national average and 49th in the nation. The cost of attending a community college, at $2,540, is 73% higher than the national average, and the *third highest* in the nation. Thus, while a higher than average percentage of Massachusetts residents have attained bachelor degrees, a markedly lower number of residents enroll in community colleges. Nationally, 2.1% of the population attends a community college, with two of the Leading Technology States, California and Illinois, over 3%. In Massachusetts, only 1.3% are enrolled in a community college.

In most states, community colleges connect low-skilled and low-income adults with the skills needed to earn living wages and pursue advancement opportunities. These programs offer vocational training and advanced education to individuals at a price affordable to students who otherwise could not expend the necessary time and resources. The students are rewarded for their efforts.

Employers pay males with associate degrees an average of 27% more than men with only high school diplomas; employers pay female associate degree holders 37% more than their counterparts with high school diplomas. Community colleges also increase labor participation rates. In March of 1996, 89.1% of the labor force with an associate degree were employed compared with 79% of those with only a high school diploma.

With unemployment among high school graduates at 5.6%, and employers increasingly concerned about the tight labor market for skilled and trained workers with technical skills, and with a static population base, community colleges are poised to play an important role in protecting the economy from restrictive labor markets. Were a community college education a more financially feasible means to increasing an individual's employability, Massachusetts workers would be encouraged to make the kind of investment in time, energy and financial resources required to advance in the workplace.

With the needed resources in place, community colleges could help create a bridge for high school graduates between short term and remedial skills programs and the higher education community and could help more employers develop and focus the skills of their workers. This would help protect the economic security of the Commonwealth through a competitive and educated workforce, in addition to the many social benefits of a more educated population.

The business-industry centers at the community colleges provide a growing resource and one excellent example of how they can serve area firms in need of training solutions. CBWL is currently working with seven community colleges to share best practices and build an information resource for firms needing training and learning plans.

B. Higher Education and Economic Multipliers

In general, the educating of the state's workforce reflects only part of the substantial contribution that the state's 118 colleges and universities make toward economic vitality of Massachusetts and New England. Massachusetts private institutions employ 125,000 workers, generating an additional 96,000 jobs in other sectors. Together with the public institutions, they are a leading agent for economic growth in Massachusetts and the region and a magnet for intellectual, cultural and financial resources. Higher education provides fertile soil for innovation, economic growth and cultural vitality, and acts as a self-renewing resource that attracts talented young people to the state every year.

Massachusetts is a net importer of freshman enrolling every year, retaining 77% (42,892) of the 55,720 Massachusetts residents who enrolled as freshman in 1994, and attracting a net gain of 10,048 (out of a total 19,897) from elsewhere in the U.S. The institutions enrolled 416,505 in 1994, including 25,739 students from outside of the U.S. Foreign students do particularly well at the graduate level: they received 28.9% (645) of Ph.D.s conferred in 1994 and 14.2% (2,947) of the master's degrees conferred.

The students attending college in Massachusetts from elsewhere in the U.S. or coming from outside the U.S. spend more than just the tuition and fees that support the institution, of course. Conservative estimates indicate that non-Massachusetts residents spend over $1 billion a year in cost of living expenditures, including room and board at dormitories and in the cities and towns in which they live while matriculating at a Massachusetts institution.

C. The Real Payload: Academic Research and Technological Development

Students enrolling in Massachusetts' doctorate granting institutions become part of an enterprise that expends over $1.2 billion a year on research and development, 72% of which is federally funded. Per capita, Massachusetts receives more than twice the federal research funds than its next closest competitor among the Leading Technology States. These expenditures help Massachusetts to lead the world in advancing knowledge and creating new products and technologies. In keeping with its historical legacy, knowledge generation continues to be a bedrock of the state's success. Fifty percent of U.S. Nobel prize winners have a Massachusetts college or university affiliation.

Research at colleges and universities has generated over 2,500 new patents in the last five years alone, spun off much hundreds of new companies, and generated profitable relationships among investors, universities and entrepreneurs as well as tens of thousands of new jobs. Our universities have issued over 800 technology licenses since 1991, generating over $12 million in revenue in 1995 alone. Licenses are but one example of how universities promote technology

transfer, which they have of late undertaken more aggressively, investing endowment funds and encouraging faculty to work with industry. The powerful new industries of software, biotechnology, photonics, and medical devices can accurately attribute their potency to the contributions of research led by academic institutions.
The higher education community is also a significant source of the leading edge medical research in Massachusetts. The major funder of health related research in the U.S. is the National Institutes of Health. It is also the largest single source of federal funding for the civilian sector in the country. As such, it has been a unparalleled force in the development of new health related technologies and scientific breakthroughs, such as medical devices, biotechnology, pharmaceuticals and other health related services. Massachusetts institutions have led their rivals in the LTS consistently, and have been able to increase funding by 104% since 1985. Historically, Massachusetts institutions have received approximately 58% of all NIH funding awarded to teaching hospitals.

To illustrate the scope of the innovations, health care institutions have disclosed over 1500 new inventions since 1991, and have filed over 800 patent applications since 1991. These institutions have issued licenses for over 500 new technologies since 1991, which generated over $8 million in revenues in 1995.

VII. Capital Markets Fuel Growth

Federal and academic research create the basis for the practical research and the technological innovations that private industry seeks to gain a competitive edge. When this occurs, private investors provide risk based capital and other kinds of financial resources that help products get to the market. This is but one reason that Massachusetts companies of all types, but particularly in the technology and leading edge sectors, have benefitted greatly from their proximity to Massachusetts' financial sector.

A. Venture Capital: Progress at Hand

Institutional investors and others complement corporate and academic research and development with private and publicly traded securities. Venture capital financing in Massachusetts has averaged about 10.5% of the total amount of private placements in the U.S. over the past ten years, trending down from a high in the early '90s of 13% to last year's 9%. The downward trend partly reflects an increase in investor confidence in other regions of the country that have historically been neglected. This trend bears watching, however: capital financing is both necessary to, and predictive of, future job growth and wealth creation in general, as well as a signal of investor confidence in a specific company's chances for success.

Venture capital financing in Massachusetts reached an all time high in 1996, totaling $831.5 million. Note, however, that that was almost $1 billion less than that invested with Silicon Valley firms.

The proportional distribution of venture capital investment in the past year was in computer software and services (32%), medical health (22%), biotechnology (11%) and communications (10%). Companies in the consumer related industries, computer hardware, industrial products, semiconductors and others make up the remainder.

These investments should create many new jobs and investment opportunities, assuming conditions are favorable for expansion. New product development yields new jobs only when the costs and benefits of producing in Massachusetts indicate locating here and not elsewhere. While Massachusetts enjoys many advantages when developing products and attracting investment resources, we note the lessons of the biotechnology industry of the early '90s, which developed products with Massachusetts based Ph.D.s and moved the production elsewhere because of high costs and lack of trainable entry level workers. Producing products at scale requires proximity to a quality workforce that includes not only a high number of Ph.D.s and engineers, but quality technical workers, who need not be baccalaureates, but do need English and math literacy, problem solving ability and reliable work habits.

B. Publicly Traded: Capital Success

The large number of Initial Public Offerings (IPOs) further illustrates the confidence of the financial community in Massachusetts based companies. In an IPO, a company offers to sell shares of its equity in the public securities markets, frequently as an exit strategy for venture capitalists. Massachusetts-based IPOs rose dramatically in 1996, capping a trend wherein Massachusetts commands a disproportional share of IPOs per capita.

The relative share of IPOs is declining however, as other regions both cultivate as well as compete more aggressively for growth oriented companies. Computer companies (software and hardware combined) form the largest sector taking companies public, followed by biotechnology and pharmaceuticals, manufacturing, and professional services.

C. Working Capital and the Power of Money

Ongoing enterprises, most of them not likely to attract or even want either venture capital or access to the public securities markets, nevertheless need sources of funds to pay employees, extend credit to customers and pay ongoing expenses. This kind of financing typically comes from lending institutions as working capital. Working capital is necessary to meet day to day

expenses and continue on an ongoing basis. It may be financed against a firm's receivables and short term assets and used to supplement cash resources as a firm's capital assets are used to leverage longer term investment, expansion and growth.

Frequently, working capital becomes hardest to obtain just when changing environments or market conditions exhaust a firm's liquidity and new opportunities become scarce. The Trust at CBWL as well as the Massachusetts Office for Business Development have seen the need for working capital threaten the viability of Massachusetts manufacturers, particularly the small, value-added enterprises that make up the great majority of the manufacturing base in the state.

Although the capital crunch of the early '90s has receded, small manufacturers are still experiencing difficulty gaining access to conventional credit markets without credit enhancements or guarantees from state or federal agencies. The Small Business Administration's loan guaranty program is extremely popular among large and small banks because it provides a 75 percent to 80 percent federal government backed guaranty against the bank loan. This can substantially reduce a bank's loan exposure and permit more private capital to flow to small businesses for working capital, equipment and real estate purposes. However, there are a substantial number of small and medium sized manufacturers who experience a financial loss while they cope with market transitions. In these turnaround cases, these manufacturers increasingly look to quasi-public state agencies for assistance in the form of financial products, such as lines of credit and working capital loans. As evidence of this important niche to manufacturers, The Trust at CBWL has made over 60 loans in the last two years valued at over $10 million and supporting 2,500 permanent manufacturing jobs. More significantly, over 85% of these loans were strictly for working capital purposes for either early stage enterprises or businesses attempting to return to profitability.

Currently, only the Massachusetts Community Capital Fund, which is operated by the Executive Office of Communities and Development, and The Trust, provide generic working capital term financing to manufacturers. However, there isn't any working capital line of credit program available at this time to support trading asset financing of small manufacturers. The need for this product deserves further examination by all quasi public finance agencies to ascertain how severe the perceived gap actually is and how it might be effectively addressed. There is further evidence that the capital access problems facing small manufacturers are most severe in rural and isolated areas such as Berkshire and Franklin Counties, and northern Worcester County where private lenders are not as prevalent, and small firms dominate.

As noted above, 1997 was the first year since the late 1980s that the Massachusetts manufacturing sector registered a net gain in employment. In light of the strength of the economy overall, the great preponderance of firms with fewer than 50 employees, and the geographic distribution of the manufacturing base, the modesty of the recent upturn argues for a more concerted effort to ensure that this sector maintains its forward momentum. A targeted and

aggressive campaign to focus a portion of Massachusetts' economic development resources toward working capital formation, particularly aimed at those firms with sound management and limited access to financial products, would ensure that manufacturers can maintain recent gains and protect future opportunities.

D. Employment in the Financial Services Sector

Venture capital, public offerings, and working capital are all part of the financial services industry, which features prominently in Massachusetts' flourishing services sector. The financial, insurance and real estate services industry (FIRE) provide a stable and growing powerhouse of jobs and wealth generation. Like higher education and telecommunications, their physical proximity to, and professional interaction with, other key industries promote healthy exchange of information and trust and the mutual gains that this promotes.

Financial services are firmly established in Massachusetts and have become a key player in the economic performance of New England and northeastern U.S. Through a serendipitous combination of such things as the "Massachusetts Business Trust", which is a legal device that led to creation of the giant mutual funds industry, world renown business and law schools, and the identification of Boston as the center of trade and commerce for much of the Northeast, this industry has been at the heart of attracting the capital, intensive business services, scholarship and high wage jobs that characterize a world class financial center.

Combined, the banking, securities, investment portfolios, insurance and real estate, contribute $42.917 billion a year to the economy in 1994 (the year for which the most recent figures are available), accounting for about 27% of 1994's Gross State Product. Massachusetts financial institutions manage $1.5 trillion in trust assets, and employ over 200,000 workers, almost seven percent of the total workforce, with an average annual wage of $51,427. As part of this enterprise, Massachusetts based investment advisory companies control 25% of the nation's mutual fund assets, which occupies the time of over 50,000 workers. Another subset, the insurance industry, employs over 100,000 workers with over $220 million in annual sales.

The FIRE industries, like manufacturing, education and other higher than average wage sectors, generally employ individuals with higher education attainment and higher salaries, and the need for strong skills even at the entry level is high. Entry level workers, who are mostly secretarial, clerical and administrative workers, earn median salaries of about $500 a week, with higher wages going to those with additional training and responsibilities. These positions offer many opportunities for advancement and numerous career paths.

The industry's larger firms, primarily in Greater Boston, have sought to protect and increase their overall productivity and competitiveness by providing learning opportunities to their employees.

These programs help employees keep pace with automation, team based work and increasing complexity of individual job responsibilities. Some banking concerns, including State Street and Mellon Trust, have also taken steps to make these opportunities available to disadvantaged adults and youth, in connection with local community based organizations, including Jobs for Youth, the YMCA's Training Inc., and Operation A.B.L.E.

This industry will provide a large number of job openings, mostly due to turnover, and workers interested in entry level positions in this industry can earn higher than average wages and better than average advancement opportunities. Workers must posses appropriate skills, including high school level reading and writing abilities, good communication and high school level math skills. Data entry, word processing, proofreading, and similar clerical tasks are among the skills in most demand.

VIII. Hospitals without Walls: Transformation in Health Care Employment

The pattern of change has not been limited to manufacturing and financial services. Long before hospitals in Massachusetts considered becoming for-profit entities, their payors, -most particularly the health maintenance organizations- were cutting their revenue streams and thus forcing them to review their cost structures and reorganize their delivery of services. Today, health care providers, whether a tertiary care hospital or a long term convalescent facility, aggressively pursue strategies to lower costs and increase the productivity of workers and capital assets.

Health care institutions, particularly hospitals, have historically provided stable and relatively high wage employment for workers with a variety of skill levels. But the efforts to lower costs have forced hospitals to cut jobs by the thousands, dramatically changing employment patterns as hospitals rationalized the delivery of care into more cost effective settings. While still the largest health care employers, hospitals have become only one type of facility in a continuum of services to the infirm. In fact, new entry level employment opportunities in the field are increasingly at non-hospital settings such as sub-acute care facilities, long-term care providers and home care.

This trend should deepen in the years ahead. As an aging population increases its consumption of health care in long term, non-acute and home settings, and capitated payment plans and HMOs force traditional hospitals to provide non-acute care outside of the hospital walls, new employment opportunities for low skilled workers will continue and in some instances increase. Home health care aides, who can expect salaries of approximately $9.30 an hour, will see an increase of 1,500 positions a year over the next several years. Nursing aides, orderlies, and nursing assistants, who earn about $8.50 an hour will see an increase of 1,400 positions a year over the next several years.

These positions, while paying higher than entry level work in sectors such as retail and food service, are certainly not lucrative, and the work is difficult. The high levels of risk associated with increased infection and injury make these positions among the most dangerous and stressful for entry level workers. The monotony and emotional drain of non-hospital institutional work add to the stress. The result: high levels of turnover, and jobs that go begging. Entry level health care employment also provides few opportunities for advancement without significant self-investment in training and education.

Health care workers are also increasingly called upon to work in team-based settings with and cross-functional capacities, which require them to manage a large number of responsibilities, communicate effectively and work successfully in groups. For example, a hospital employee today may be in charge of helping patients fill out menus, laboratory and patient transport, certain housekeeping duties and maintaining supply closets. The same worker may be asked to train new employees in her department and assist in supervising staff another day. The increase in worker flexibility is but one way that costs have been lowered, which incidentally has provided some important economic benefits. Savings for the employer hospitals can be (and have been) translated into lower rates of increase in health care costs for insurers and their subscribers. The challenge is to maintain quality with the remaining workers.

The North Shore Medical Center in Salem was the site of a recent worker training project led by CBWL and funded by a $557,927 grant from the U.S. Department of Labor. This project served to provide important lessons in averting layoffs in hospitals and increasing quality of care through effective worker skills enhancement programs, which we expect to replicate elsewhere. Most significantly, the project demonstrated the need to include a comprehensive training plan when a hospital restructures its service delivery. When this is done, workers can demonstrably retain employment by acquiring new skills that will be useful to the restructured hospital.

A Cape Cod initiative may also offer some insight on addressing the high stress and lack of upward mobility that confronts health care workers in the new economy. A group of health care employers, the local chapter of the Service Employees International Union, and employees themselves have mapped out career opportunities within the local health care industry and help workers acquire the necessary skills and navigate the barriers to moving up in their careers. The SEIU's Boston local has been working with housekeeping and transportation staff in area hospitals to help them qualify for medical technician jobs. We will watch these initiatives closely as they mature.

IX. The Fishing Industry: Reluctantly Charting a New Course

The fishing industry in Massachusetts, although a relatively small share of the state's economy,

has nevertheless been historically central to its host communities. These communities, most notably Gloucester and New Bedford, were devastated when in 1994 and then 1996 the National Marine and Fisheries Service instituted amendments to the Northeast Fishery Management Plan limiting the number of days at sea, the size of effort and the allowable locations to fish. The new rules have substantially reduced fishing effort for groundfish in Massachusetts Bay and elsewhere, devastating the communities that had relied on those resources for their livelihoods.

Many families were heavily mortgaged to invest in the equipment necessary to earn a living at sea when the new rules went into effect. Smaller fishing businesses found themselves particularly hard hit, lacking the resources to expand and diversify their catch. In general, the loss of income and the related social problems have been persistent. Geographic and cultural isolation have combined with financial investment, a general reluctance to leave the industry and limited education to aggravate the difficult transition.

Through a grant from the U.S. Department of Labor, the Corporation for Business, Work, and Learning has established Family Assistance Centers in Gloucester, New Bedford and Cape Cod. The DoL provided funding of $6.7 million for the three centers through November of 1998. To date, the centers have enrolled 550 individuals, and provided classroom training to 395 people, occupational training to 305 people, and ESL or adult basic education to 90 people. Of the 550 enrolled, 180 continue to receive services. So far, the results have been favorable, with 82% entering employment, 89% of whom entering the field for which they were trained. The average wage for participants is $13.15 an hour.

The greatest challenge to working with the families affected by the closing of the fisheries continues to be recruiting individuals. The difficulty arises through the profound psychological commitment many fisherman maintain to their former livelihoods and their reluctance to believe that the rules will remain in effect for the foreseeable future. As a result, our outreach to these families continues to be the ongoing focus of the project.

X. Entry Level Employment Available If . . . .

The current Massachusetts economy amply rewards those with high level skills, particularly those with four or more years of college. Industries that emphasize high level technologies, access to a mix of emerging and mature markets, and can benefit from their proximity to the Massachusetts higher education and investment communities have performed particularly well in this economy.

But a healthy economy must utilize all of its assets, including employing individuals without high level skills in a way that provides them with living wages and opportunities for advancement. The review of this economy on that score is decidedly mixed.

Entry level jobs - those requiring only a high school diploma and little or no other training - total about 1,119,600, or slightly more than a third (36%) of the state workforce, reflecting a trend favoring college and other educational attainments. Within the broad group of workers that fill those jobs, salaries and benefits range widely, according to sector, individual qualifications and geographic location. These workers are not, by and large, unskilled. The workers in this category typically provide their employers with diverse sets of skills that are acquired in high school, on the job or at the employer's expense, or in short term programs. They also include a range of other life skills, such as work habits, leadership, organizational skills or other attributes valued by employers but difficult to quantify through certificates and other credentials.

It is these skills that employers will continue to demand and reward. Automation and other factors have combined to change the face of work in virtually every sector, and with the possible exception of retail, these changes have increased the need for employees with high school level reading and math, good communication skills, and ability to work in teams. Even as these changes continue to erode the base, replacement needs and some modest growth will combine to create an average of 38,000 openings a year over the next few years.

The largest share of entry level positions are in business and office administration, including general office clerks, bank tellers, stock clerks, receptionists and customer service representatives. Massachusetts' clerical and administrative support personnel work throughout the industrial sectors, accounting for the second largest number of jobs (566,200) in Massachusetts. Nearly 70% of Massachusetts's clerical and administrative support personnel work full-time and 76% are women. Over half have little or no formal training beyond high school, and an additional 25% have 1 to 12 months of formal training.

These positions are not only the most plentiful, but pay the highest among entry level position, with many averaging well over $20,000 a year. With the possible exception of production workers in manufacturing firms, business and office administration positions also offer the most opportunity for advancement and higher wages, particularly for those individuals who further their educations.

Access remains as a barrier, however. Better paying positions are geographically concentrated in metropolitan Boston and suburban office centers, and away from smaller and older cities. Moreover, the suburban office parks are usually at highway locations and rarely accessible by public transportation.

Skill levels are also rigorous for entry level employment, at least by historical standards. At a minimum, these positions require high school levels of English and literacy (in addition to a high school diploma), eliminating prospects for the segments of labor market with linguistic or educational deficiencies. For those who need remedial education and find themselves on waiting

lists for adult basic education, their prospects for these types of jobs are not good.

Sales/Retail/Marketing, Food Service, Building/Facilities Services, Transportation, and Health Care, in descending order, make up the remainder of entry level positions. Sales/Retail and Food Services pay the least. Together, Sale/Retail and Food Services also provide most of the expected entry level job growth for the next five years.

Many of the lower paying entry level positions rely on low-skilled workers new to the workforce or participating in the secondary labor market, such as second jobs, part-time jobs to supplement household income or to maintain some income while looking for better opportunities. However, that is not exclusively the case. The evidence is mounting that for a large number of full-time workers, low-skilled employment is not only an ineffective antidote to poverty but can also act as a barrier to skills acquisition and progress in the labor market. Consequently, the working poor are falling further behind.

These workers live throughout the Commonwealth, particularly in the many communities around the state that have not enjoyed the same levels of success of the more prosperous areas. Some 600,000 individuals currently live below the poverty line ($16,500 a year for a family of four). Half of the adults in this group are employed and 43% head two-parent families. Cities like Lawrence, Brockton, New Bedford, Fall River, Holyoke and Pittsfield share a storied and impressive industrial history, but also a future heavy with the challenge to provide economic opportunity for their residents. Similarly, rural areas throughout the state, including Franklin, Berkshire and northern Worcester counties, have high unemployment rates, and rely on just a few employers for the jobs in their regions.

Compared with the Miracle years, the current rate of poverty, which disproportionately afflicts the cities and towns like these, has not substantially improved, and by some measures has worsened. In the peak of the Miracle years, the Center for Labor Market Studies at Northeastern University has calculated that the New England region had the lowest poverty rate in its history at 5.6%. This rate increased to 8.4% between 1989 and 1992, where it has stayed through 1995. Married couple families have progressed in the current period quite favorably, with poverty rates at 2.6%, the lowest ever. For female headed families, poverty rates in New England remain stubborn at 32%.

Low-income female headed families in particular have generally not shared in the economic gains of this expansion. Female headed families in poverty in 1995 were twelve times as likely to live in poverty than married couple families, up from a multiple of eight in 1989. As a result, 66% of all families in poverty were female headed, compared with 54% for the nation. This trend continues even as the number of families on welfare decreased by 24%, labor participation rates are high and unemployment is low.

The trend continues beyond those living in poverty (approximately 10%) and into the lowest quintile of income levels. The income distribution is widening as the ratio of the mean income of the highest to the lowest quintile increased to 10 in 1995. While incomes per capita for the top 20% have indeed increased, average income for the bottom fifth *dropped* from $8,921 to $7,869. Massachusetts ranks 39th nationally for income distribution. Compounding the poverty is access to healthcare. Medical insurance coverage for those not qualifying for Medicaid, i.e., for individuals living at 133% of the poverty line, has been authorized but not been fully funded, even while the number of individuals qualifying is increasing. The access to health insurance has been cited as one of the most reliable indicators of a low-wage employee's likelihood of remaining employed.

XI. The Demise of the Gun Belt

At the end of the Cold War in 1991, the Department of Defense began to reduce its procurement and its infrastructure needs, both with respect to its supplier base and its physical plants. For Massachusetts, which in 1990 ranked third in defense revenues after California and Texas, the impact might be described as "creative devastation".

Between 1992 and 1995, over 100,000 defense related jobs disappeared, while the value in defense related contracts shrunk by 54%. The manufacturing and research functions of such giants as GE, GTE, Raytheon, MIT, and MITRE, as well as in excess of 6,000 other firms that receive defense contracts shrunk accordingly. For the primes alone, the dollar value of DoD contracts has moved from a high of $8.3 billion to $3.8 billion.

A. Getting Firms the Help They Need

The drastic decline in DoD purchasing has eliminated a sizable number of companies and forced many others to make radical reductions in employment. However, the years of DoD procurement had also created a local manufacturing capacity with some distinct advantages in the new economy. While these were generally not firms that worried about costs or competitive markets, they did pursue innovation and quality and employ high end if not state of the art manufacturing technologies. As a result, the firms that survived and adopted more competitive strategies have been able to expand into new markets. Thus, in the wake of the devastation of this market, some firms have pursued new opportunities with increasing success. These successes can be built upon with continued efforts to help firms with viable product lines reach new markets on a competitive basis.

The Corporation for Business, Work, and Learning, in concert with the Massachusetts Office for Business Development, has reviewed the effects of the DoD builddown and concluded that the

Massachusetts defense industry firms have substantially implemented their responses to changes in the U.S. defense industry. The impact of the defense cutbacks appears to have stabilized, and for the foreseeable future, change is likely to come at a somewhat more manageable pace. We would offer three caveats to that general observation.

First, of the firms that have survived the reductions, a number have found other markets for their products. Most, however, continue to rely primarily on the DoD. This is possible in part because of the winnowing process that took place, and in part because of the DoD's desire to maintain the production capacity of the defense industry for national security reasons. Those needs may change in the future, particularly as other regions become more competitive. *Second,* many of the firms' diversification strategies have focused on defense procurement of other nations. Opportunities abroad may indeed increase in the future, particularly if more nations are admitted to NATO, or other strategic integration occurs. However, these situations are presently unpredictable, and also leave these firms vulnerable to political stability and to the concerns of the U.S. State Department, the Pentagon and the Congress. *Finally,* recent stability in the manufacturing sector does not indicate complacency with respect to the defense firms that remain. Several are continuing to confront the changes through mergers and reorganizations with other defense based firms in the country, the effects of which could be felt throughout the manufacturing sector, particularly for diversified supplier firms. Efforts to help defense based firms diversify and become competitive will increase the stability of the manufacturing sector overall.

The details of the historic dependence on the DoD underscore the need for firms to avoid over-reliance on any one customer in the future. In 1989, defense dependent jobs formed 6.5% of the entire job base in the state (199,568) and by 1994 that number had shrunk to 2.7% (79,297). Major subcontractors report that defense attributable revenues declined from 84% in 1991 to 58% in 1995. Minor subcontractors report that defense attributable revenues declined from 69% in 1991 to 58% in 1995.

Despite a skilled workforce and overall high quality production, defense-based firms had difficulty responding to the changes for many reasons. Lack of a sales force, highly specialized products, and lack of financing for new R&D limited the sector's ability to move into commercial markets. The DoD's procurement policies, under which firms were paid on a "cost-plus" basis, also created cultures that had difficulty adapting to market based pricing. Although many of these limitations persist, part of the problem presently is that the firms do not know what is available in the form of publicly supported assistance. Indeed, most of the firms surveyed suggest they would be receptive and responsive to efforts to help them address the recent and ongoing changes in their markets, but they are generally unaware of what resources are available.

While a generalized information campaign might be useful, we believe that further actions taken

in response to defense downsizing target specific needs at the firm and community level. These projects would become part of the effort undertaken on behalf of all manufacturing firms. Such projects could do the following:

- Address the need for skilled and flexible workforce through training targeted at new and incumbent workers;
- Provide greater access to working capital, particularly in viable companies with debt to equity ratios that make the cost of working capital prohibitive and limit growth opportunities;
- Promote deployment of new and state of the market technologies through extension services and technology transfer offices at universities;
- Promote greater access to new export markets; and
- Distribute the resource guide created by MOBD to increase information available to firms facing economic dislocation through defense conversion.

Our experience with defense based firms as well as manufacturers teaches that there is no substitute for direct, hands-on work with the firms. This work must be both holistic in approach and rooted in the goals of the company.

B. Communities Left With Less

Firms are not alone in enduring hardships from the drop in defense expenditures. A number of communities throughout the Commonwealth have been adversely affected by the decline in revenues. The closing of military installations at Fort Devens and South Weymouth has had serious implications for both the local governments as well as the many businesses that supported those installations. Sales tax and property tax bases have decreased as workers stopped buying goods and meals and homeowners sold their properties in pursuit of opportunities elsewhere. School districts suffered losses of Payments in Lieu of Taxes that the military paid to help defray the cost of educating children living on the base.

The presence of very large firms in cities like Pittsfield and Lynn, which had less diversity in their economies to absorb layoffs at the large firms, made those cities more dependant and therefore more vulnerable to the dislocation of layoffs and plant closures. Like the areas that suffered base closures, these communities were also home to a number of small entities that relied on the presence of the military installations or primes, directly supplying the base or plant as well as providing services to personnel. The repercussions of the plant or base closures

continue to ripple throughout the affected cities and towns.

The MOBD has created a comprehensive resource guide to direct communities to federal and state resources that can be used to address difficulties at the local government level. Federal resources include Department of Education funding for school districts facing revenue losses, Department of Defense funding, and the Department of Commerce's Economic Development Administration funding for communities seriously affected by cutbacks in defense spending.

State resources include those offered by the MOBD, the Executive Office of Communities and Development, the Mass. Development Finance Authority, and the Community Economic Development Assistance Corporation. These agencies can provide seed capital, industrial bond financing, permitting assistance, environmental impact analyses, real estate development assistance, and lender guarantees to help communities make valuable use of fallow property and abandoned plants.

C. Workers Put the Face on the Cost

At the heart of the difficulty with defense downsizing are the workers and their families. Since 1989, over 120,000 jobs in the defense industry were eliminated. The story is as current as this season. In September, 1997, General Dynamics Defense Systems in Pittsfield announced that approximately 650 layoffs would take place between September and June, 1998. The workers laid-off are primarily older, with an average length of service of twenty-six years. Their average wages are 20% higher than the average wage in the region. They fall into groups ranging from highly skilled engineers, toolmakers and white collar workers to floor clerks and maintenance workers in need of adult basic education. They also live in a region that has experienced declining employment base over the last decade, with the largest losses in manufacturing, transportation and public utilities.

The strong economy of the entire state is small consolation to the middle-aged production worker in Berkshire County who will find few equivalent opportunities in the local economy. Workers will look to the plastics industry, which has grown steadily during the past decade, and the paper industry, which has started to rebound after sustaining several years of losses.

In addition to its Rapid Response efforts described in more detail below, CBWL has administered five large scale on-site programs, which served approximately 2,609 workers losing their jobs as a result of defense conversion. The U.S. Department of Labor has also recently awarded a National Reserve Account grant to Massachusetts to serve the workers dislocated by the General Dynamics layoffs in Pittsfield.

XII. Training: Making the Transition to New Work Settings Manageable

Irrespective of the strength of this economy or any other, layoffs and plant closings are part of the natural course of economic life and will continue to occur as businesses close, reorganize and otherwise respond to external and internal realities. For the workers whose lives and livelihoods are disrupted by these events, CBWL has developed and managed a combination of strategies to help individual workers prepare for, and respond to, the challenge before them. These strategies can be divided roughly into three categories: (1) Training to workers during their employment; (2) training and labor market orientation to workers who are about to lose their jobs, and (3) training to workers after they have been laid off.

A. Training the Incumbent: Good for the Employer, Good for the Employee

The work that CBWL has done to help mitigate the defense firm builddown has taught invaluable lessons in helping companies of all types design effective strategies to deal with layoffs, market changes, re-engineering and diversification. One of those lessons is to focus on workers who are currently employed.

Training the incumbent is generally more cost-effective than training the dislocated worker. Once workers are dislocated through layoffs or a plant closing, the stakes and the stress for the worker can be overwhelming. These workers often need new skills and usually a reorientation to the labor market. They also need to replace their income and their sense of security, connectedness and self that comes through participation in the labor force. Workers confronting recent job loss frequently find that the time and energy needed for skills acquisition is directly at odds with the immediate need to find a new job. Similarly, the sense of loss and the blow to self-esteem that often characterize recent unemployment make it that much more difficult to mount the energy and courage needed to participate in a new skills program. These kinds of issues make providing services to dislocated workers extraordinarily complex.

In the course of helping the firms meet their market-based needs, we have found that workers are best able to enhance the skills needed for the new economy *while they are employed.* This is as true for defense based companies as it is for companies with commercial markets. When possible, we seek to help employers find training solutions to their business needs by conducting company based assessments and helping the firm develop a comprehensive approach to its various training requirements. This prepares workers for change and reduces the chances of layoffs. The most successful firms develop plans that integrate basic skills and ESL training with shop floor technical skills, which has been shown to be a highly effective method toward reaching the firm's goal of high performance and highly productive employees. Firms throughout Massachusetts can intelligently and cheaply provide comprehensive multi-skill training programs that address the firm's goals in the marketplace and integrate the challenges of

adults in need of remedial skills, English, or basic communication skills.

With the support of a mix of philanthropic, federal, state and other resources, including the U.S. DoL, the National Institute of Standards and Technology, The Pew Charitable Trusts, the National Governor's Association, the Joyce Foundation, and state funded resources, we have worked with employers seeking higher productivity, and with employees who remain at a company that has experience layoffs or whose firms are seeking the higher skill needs requisite to the new economy. Our mission is to update and improve worker skills and in this way increase both the ability of employers to move into new markets and product lines and the agility of the workers to meet the needs of their employers or move into new employment settings.

In an ongoing collaborative project with the National Association of Manufacturers and the Council for Adult and Experiential Learning, called the Partnership for a Smarter Workforce, CBWL and its partners have tested certain strategies to encourage and improve employer sponsored training. The project has provided important insights on the barriers that prevent or inhibit firms from increasing worker skills, the challenge of linking training projects with specific business strategies and production needs, and the rewards to firms throughout a supplier chain when individual firms commit to improving internal training capacity. As the project enters its final year, we have already begun to implement these lessons learned in the context of all of our employed worker training efforts.

The Partnership for a Smarter Workforce builds on a number of efforts as well as assists in our ongoing work elsewhere. For example, in the U.S. DoL funded Textron Supplier Project, CBWL staff worked directly with Textron's supplier firms to develop their workforce into more highly skilled and flexible workers and thereby remain competitive for future opportunities. This project has trained over 1,200 workers, enhancing the supplier-customer relationship, increasing the competitiveness of Textron's value added product lines, and tightening Textron's link to the Massachusetts economy. Also using Department of Labor funding, CBWL developed and delivered training for over 759 workers at the Textron Systems Division. This project has helped position Textron Systems Division to move into new markets and their employees to acquire skills needed for commercial based and non-DoD product lines. Both of these DoL funded projects demonstrated the close link between an careful plan for increasing worker skills throughout the supply chain and the success of the supply chain as a whole.

Other examples include the following:

- Over 1,200 employees at GTE in Taunton and Needham received training in skills that helped the company increase its number of commercial contracts by nearly 20%.

- CBWL successfully completed the Strategic Skills Program, a three year defense diversification project that trained more than 3,300 workers from thirty-one defense dependent firms.

B. Rapid Response: Getting Help to Workers Before Their Work Is Through

Layoffs are inevitable. When layoffs do occur, time is of the essence for the workers involved. The Massachusetts Rapid Response Team provides re-employment services to companies and their employees as soon as it becomes clear that job losses will occur. This early intervention strategy can reduce the cost and pain of layoffs for both the employers and the employees and helps workers mediate the transition into the labor market, often without any break in their employment.

Not all workers make the transition without having to acquire new skills, of course. The Rapid Response Team, working with the employer and the workers, provides a systematic and comprehensive set of services that include assessing a worker's skills and need for training. Rapid Response can then enroll workers in any of the battery of services provided by the Worker Assistance Centers, including such things as ESL, remedial English and other basic skills, as well as more job related skills. In the event of a large plant closing, on-site centers are created expressly for these services. In any event, Rapid Response offers all workers on-site individual counseling to assist them with virtually every step of the process, including conducting a job search, preparing a resume, and minimizing the stress and uncertainty connected with job loss.

In FY '97, CBWL's Rapid Response Team provided early intervention services to 5,064 workers in 170 layoff situations. To provide a sense of the scale, geographical range and significance of this effort, we include a list of the Rapid Response Team's projects over the past three years as Appendix A.

C. Training and Preparing Dislocated Workers for Times Ahead

Workers who do not find new employment immediately or shortly after being laid off can use a variety of services provided by CBWL, the DET, or One Stop Career Centers to help navigate the labor market and take advantage of training available through JTPA Title III. In those instances where foreign trade has caused the dislocation, the Trade Adjustment Act funds comprehensive training and re-employment services as well. The latest labor market information, collected, analyzed and disseminated by DET, is available through CBWL's Worker Assistance Centers, the One Stops Career Centers located throughout the state, or the DET's employment centers. Additional labor market information, such as job postings, is also frequently available through these services. In addition to labor market information, these

services help individuals develop resumes, job finding strategies and assessments of personal skills, education and attributes, all of which can help an individual make good choices. These services can also identify training programs appropriate to an individual's objectives, and help an individual qualify for enrollment in a training program, which are administered by CBWL.

Each of the services above work closely with the 16 Regional Employment Boards, which coordinate policy and program services for their respective regions, some of which get directly administered by their administrative agents, know generically as Service Delivery Areas. Although the boundaries between the services provided by the Worker Assistance Centers, the DET, and the One Stops are, by design, permeable and flexible, in general, all provide labor market information, assessment services, and referral to training programs. CBWL and the SDAs also provide dislocated workers with actual training through the Worker Assistance Centers, either by contracting with a program operator or by offering training directly.

Last year, the DET, which also paid unemployment insurance benefits to 251,112 citizens, provided a range of employment services to 140,215 workers (who need not have been unemployed to receive services). In FY '97, CBWL's Worker Assistance Centers provided complete re-employment services to 12,240 dislocated workers, of whom 4,284 enrolled in occupational training and 998 enrolled in adult basic education. Last year, seven One Stop Career Centers served over 30,000 individual customers, and the addition of more centers over the next year will make the roll-out of this new and innovative service nearly complete.

XIII. What the Future Holds

An economy is not quite like New England weather. It takes more than a moment to change, and it is very much a human enterprise. However, like the weather, it is an open, complex system governed more by the laws of chaos than by simple rules of cause and effect. As such, we can't know whether the butterfly that beat its wings in a far corner of the world today will create a hurricane next month in Boston. Regardless of the apparent strength or sturdiness of this expansion, it would be foolhardy for us to offer predictions as to how long the economy will continue to expand, whether it will increase, dwindle or stay the same for any period of time.

The apparent strength of the current local and national economy has itself given some observers pause. As the Federal Reserve's senior vice president Lynne Browne said in *Massachusetts Benchmarks,* "I find it difficult to find anything to worry about, which in itself makes me worried." However, some observations seem appropriate and at least appear to be widely held.

First, having weathered and survived a real transformation in a number of industries, all of which now appear stronger for the journey, the complex and multi-dimensional character of the firms and industries that fuel the current growth indicates some degree of economic stability over time.

This stability also suggests the need to ensure continued or greater access to skilled workers and productivity enhancing technologies, which will help sustain the current growth period.

Second, the government's fiscal stability, its commitment to education reform and its ongoing efforts to lower the cost of doing business in Massachusetts, combined with the apparent absence of such anomalous conditions as speculative real estate markets or over-reliance on particular sectors also suggest a period of relative stability ahead.

Other signs support this analysis. While the current period of economic expansion is now longer than the expansion of the '80s, with the exception of certain labor markets, structural weaknesses are not generally evident. We are experiencing a low rate of inflation nationally, which, combined with the increase in global competition, the evident weakness and excess capacity in some foreign markets, and continued capital mobility, should inhibit local inflationary pressures. While tight labor markets in high growth industries may limit their performance, better opportunities elsewhere in the U.S. are not presently obvious.

These conditions generate overall confidence among Massachusetts business leaders. Business owners report that their level of confidence is at a record high of 70.9%. The Associated Industries of Massachusetts survey of its members showed the highest level of confidence since 1991, when the survey was first introduced. A similar survey of businesses conducted by Small Business Association of New England indicated a significant majority of their Massachusetts firms expect to increase sales and increase employment. Consumer confidence is also reportedly high, although this may fuel greater indebtedness, squander investment resources and place more people at risk for bankruptcy.

Many sectors have prospered in this expansion, perhaps making its strength more resilient. Adding to the resilience of diffusion is the diversity and resilience of the markets for locally produced products and services. The largest gainers of the strong economy, including software, telecommunications, business services and medical technology, have diverse global markets, generally driven by business needs rather than consumer demand. These needs, while subject to cycles of their own, are driven by the changes in the economy outlined above, such as the need to increase intra and inter-firm communication and computing capacity, to adopt new technologies and to employ the kinds of services that businesses now rely upon for their survival. In other words, the biggest limit on Massachusetts firms selling their products is their ability to provide them to a hungry market.

The labor markets also support some continued stability, albeit probably not much growth. Despite a very low rate of unemployment, a recent study by the Center for Labor Market Studies at Northeastern University argues that Massachusetts does not appear suffering from a generalized labor market shortage, but rather certain spot shortages that will inhibit the growth in the affected sectors. The 329,000 new jobs created since 1991 falls short of the 364,000 lost

between 1988 and 1991 and of the 434,000 jobs added between 1983 to 1988. Assuming stable population, continued modest foreign immigration, and continued net emigration from Massachusetts to other parts of the country, this economy can only grow by adding to the skills of the current pool of workers.

Except in certain sectors, wages have generally not outpaced inflation, indicating that pressure on employers to increase wages in response to labor shortages are generally not taking place. Workers have on average received increases sufficient to avoid erosion of their wages due to inflation, and they have increased their inflation adjusted earnings by increasing the number of hours worked. Only at the high end of employability and in highly productive sectors have workers enjoyed wage gains that have substantially outpaced inflation.

The current economy supports both increased earning power for skilled workers and increased reliance on college educated workers, largely due to the shift to service industries. The largest number of new jobs (56%) has been concentrated in professional service industries, including health care, computer and business service industries. The result is that unemployment among college graduates is under 2%. For those with high school diplomas, unemployment is somewhat higher at 5.7%. Given the stability in the population, it is this slack that presents the only real opportunity to support continued growth, manage spot labor shortages and increase the earning power of the workers. A renewed effort to invest or encourage self-investment in this part of the workforce will yield a high return of increased employability, wages, and tax revenues as well as relieving the pressure at the higher end of the labor market.

XIV. The Policies of the Past Five Years

Just as a complex system is hard to predict, a look to the past is not always a sure map of how the path traveled was charted. The difficulty is correctly identifying cause and effect. However, the policies of the last five years and the programs that reflected those policies seem to have made multiple and strong contributions to the state's current economic expansion, and these policies should support continued favorable economic conditions as well.

In particular, we note that Massachusetts has aggressively pursued several policy goals to support economic growth and provide economic opportunities to citizens into the future. While this list is not by any means exhaustive, we have looked at the following five policies and some of the programs that were developed in pursuit of those policy goals:

- Lowering the Cost of Doing Business in Massachusetts;
- Improving K-12 Education for All Students;

- Improving Workforce Development Efforts;
- Protecting the Manufacturing Base; and
- Reforming the Welfare System.

These policies reflect clear and important social and economic goals, and that clarity of purpose has by and large generated definite strategies and programs. In some instances, they have also produced some definitive results, while in others the benefits will become apparent over time. The following is a brief look at these policies and programs.

A. Lowering the Cost of Doing Business in Massachusetts

Perhaps the hallmark of the past five years has been the lowering of certain structural costs of doing business in Massachusetts and certain costs of living. These costs have historically limited growth and investment in Massachusetts and, together with its relatively cold climate, serve as counterweights to the state's reputation for quality of life, strong workforce and access to capital and markets. The costs range from taxes to insurance to energy. Lowering these costs has given business leaders concrete and specific measures for their renewed confidence in the state's economy and its prospects.

In particular, we note the following steps that have been taken to reduce the cost of doing business in Massachusetts:

- In 1993, the 5% sales tax on services was repealed;
- Research and Development Tax Credit supports key strength of economy;
- Long term capital gains relief provided to investors;
- Single sales tax for manufacturers and defense-based companies;
- Bank tax reform, lowering the tax on bank income by two percentage points;
- Mutual fund single sales tax;
- The reform of the state's workers' compensation system, which led to the third straight year with a double digit decrease; savings to employers estimated at $1 billion;

- Unemployment insurance rates stabilized and lowered, saving employers $200 million each year; and

- Environmental permitting process streamlined for new and expanding facilities.

More reductions in the costs of doing business are expected. They include

- A 12.25% decrease in workers' compensation costs proposed for 1998;

- Energy deregulation, which should foster innovation and price reductions in the market; and

- Lowering of auto insurance costs for consumers.

Partly as a result of these efforts, Massachusetts was rated as "good" or "outstanding" by 88% of high-tech CEOs in 1997.

B. Education Reform: A Substantial and Sound Investment

The Massachusetts workforce has historically enjoyed a reputation for quality and educational attainment. Like the rest of the nation, however, recent trends have raised concerns that the education system was not succeeding with a significant percentage of students. The Education Reform Act of 1993 was a concerted effort to respond to those concerns and protect the quality of the state's workforce and its reputation.

As a direct result of these reforms, students enrolled in the Massachusetts public school systems, the single largest and most important investment in the workforce, will enjoy new opportunities and new rigors in from kindergarten through graduation. Higher standards and more rigorous curricula are being developed and implemented to ensure that students are prepared to meet the challenges of the future. Students will be expected to master specific skills, competencies and knowledge throughout their twelve years in the public school system. Curriculum frameworks have been developed and are currently being operationalized to ensure that all teachers know what students are expected to learn.

Teachers also need to know what students have learned. The Mass. Comprehensive Assessment system serves this need. Under the new assessment system, educators, students and parents will know if the schools have succeeded. Students entering the tenth grade will all take a test to indicate their levels of competency in mathematics, science and technology, history and social science, and English. Comprehensive diagnostic assessments will be conducted at least in the fourth, eighth and tenth grades, and they will identify academic achievement levels of all levels.

The Act further encourages schools to develop "authentic gauges of performance" that test subject matter knowledge and can factor in multi-disciplinary learning projects, not unlike the kinds of project-based work that characterizes employment in the new economy. School districts are also required to adopt and implement a professional development plan for all principals, teachers and other professional staff employed by the district.

The reforms promote greater integration of curricula with the world of work by eliminating the "general track" and replacing it with a system that strengthens and integrates academic and vocational education components. This is expected to become part of a trend in which schools and employers are more connected and interactive.
In keeping with this trend, students can pursue a Certificate of Occupational Proficiency if they complete a comprehensive education and training program in a particular trade or professional skill area. The Certificate will represent a determination that the recipient has demonstrated mastery of core skills, competencies and knowledge. Massachusetts also sought and received a five year grant under the School to Work Opportunities Act, which will support institutionalizing career development for students and integrating the activities of the classroom with the needs of the employer community.

1. The Massachusetts School To Work Program

One of the stated goals of education reform is to build career pathways for students, and promote greater integration between employers and school systems. The Massachusetts School to Work Program is a federally and state funded project to build in the infrastructure and the relationships that will support that objective. Currently, the project has established dozens of successful partnerships between the schools, employers, parents, labor organizations and community groups, creating career pathways and increasing the rigor of the educational system in doing so. More than one-third of all secondary schools in the Commonwealth now offer career pathways or rigorously introduce their students to career options.

The overarching present goal is to make those existing local partnerships part of a comprehensive statewide school to work system. Currently in Massachusetts, nearly 90% of students reside in districts with school to work partnerships, an important step toward a statewide system. Nearly 7,000 students participate in paid or unpaid workplace internships connected with classroom activities, and more than 2,500 employers are providing work-based learning opportunities for students. When coverage is complete, and the programs are thoroughly integrated into each local district, each student will have a greater range of opportunities to develop skills that will better prepare them for college or employment.

2. Engaging Communities in School Reform

The Center for Youth Development and Education (CYDE) at CBWL has taken the School to Work concept of engaging the employer community a step further by seeking to integrate even greater parts of the community with local school districts. The program is called Communities and Schools for Career Success (CS^2) and is an initiative to establish a cost-effective way to link middle and high schools with community resource to create a coherent sequence of services and experiences to help young people make successful transitions to their adult responsibilities of further education, training, and employment. CS^2 is primarily funded by a $2.7 million grant from the DeWitt Wallace Reader's Digest Fund, with additional funding provided by other foundation support and by the Commonwealth. It is being implemented in Amherst/Northampton, Barnstable, Boston, Brockton, Fitchburg/Leominster, and Springfield.

Each of the CS^2 communities selects at least three "entrepreneurs" who work at either the middle school, high school, or school district/community level. Working closely together, these locally based teams help organize and drive the establishment of a coordinated system of academic and work experiences and support services for the youth of the community. To do so, they look beyond the traditional resources of the school to form partnerships with other educational institutions, businesses, students and parents. The goal is to engage the entire community in ensuring that students will successfully progress from middle school, through high school, and on to adulthood.

3. Diploma Plus: A Second Chance the First Time Around

The CYDE also champions the cause of at-risk students and out of school youth. The challenges these students face are very real. If they do not complete their high school education, even the strongest economy will not employ them. Currently over 16% of high school dropouts are unemployed, and those that hold jobs are earning poverty level wages. Regardless of a student's native talents, energy and intelligence, if the social pathologies surrounding the child cause him to leave school, he (or she) is virtually doomed to a life of failure and poverty. Even a GED, while a positive step, is likely to make little difference as a stand-alone credential in the student's earning power.

The CYDE has developed a model program for at-risk youth known as "Diploma Plus", which aggressively integrates work-based and school-based instruction and introduces students to post-secondary education as well as to workplace competencies. Diploma Plus seeks to recruit students who are at risk of dropping out or who have recently dropped out of high school and immerse them in a program that will not only provide them with an actual diploma from their district, but will prepare them for college and the workplace.

C. Improving Workforce Development Efforts

Like many states, Massachusetts has a complex and at times confusing system of providing skills, training, and labor market support, most of which is driven by federal policy. Policy makers throughout the state recognized the problems wrought by the complexity, and in the early '90s, the U.S. Department of Labor gave the states encouragement to consider alternatives. In 1994, Massachusetts, led by the MassJobs Council and others, accepted the challenge to transform the array of employment and training programs into a quality, integrated delivery system. As a result, Massachusetts sought and received a five year grant of $10 million to create a system of one stop career centers. Today those career centers are operational in seven locations, with others planned to open in the coming year.

Policy makers also took steps to lower the cost and raise the quality of public higher education in Massachusetts. In 1997, pursuant to legislation, the Massachusetts Board of Higher Education lowered the cost of tuition for a four year college by five percent and the cost of community college tuition by ten percent. While the tuition and fees (which are set by the individual campus) remain among the highest in the nation, this tuition reduction represented an important step and a real commitment toward making college education more affordable. In December of 1995, the Massachusetts Board of Higher Education (then the Higher Education Coordinating Council) adopted higher admission standards for students applying for admission into public four year colleges and universities, ensuring that these institutions will attract and retain students with strong academic backgrounds who enter college prepared to learn.

Until recently, the state has also done little to encourage employers to provide training to current employees. This attitude ignored both the fact that most companies lacked the resources or the understanding to provide training to workers, and the larger need to ensure that the skills of the state's workers kept pace with the needs of the new economy. Other states, such as California, Illinois and New Jersey, meanwhile devoted large amounts of resources to employed worker training. Recognizing the competitive need for highly skilled workers, the cost-effectiveness of providing skills to employed workers, and the barriers that companies face in providing training to their workers, Massachusetts has adopted the policy goal of increasing the skills of employed workers and helping firms overcome the cost and other barriers to making training available. The policy materializes in at least two formats.

1. Employed Worker Collaborative

The Employed Worker Collaborative is a state-funded program to increase worker skills while they are employed. CBWL, which administers the program in collaboration with the REBs, has worked aggressively to provide training resources to workers of

Massachusetts companies, particularly those at risk or at small and medium sized establishments. The Employed Worker Collaborative is the combination of the Employed Worker Initiative and the Targeted Training Initiative, made possible by the merger of the Bay State Skills Corporation and the Industrial Services Program. The Collaborative will provide over $1 million in training grants to companies in Massachusetts, and builds on knowledge acquired through a number of incumbent worker training projects in Massachusetts.

2. Malden Mills Workers Get the Skills To Put the Company on its Feet

Massachusetts and the U.S. DoL each contributed $1 million in support of "Project Steps", a CBWL-led project to provide over 900 Malden Mills machine operators, maintenance workers, and front-line supervisory staff with important foundation skills, including computer literacy, basic mathematics, English for speakers of other languages, and basic literacy. Massachusetts' commitment to workers at Malden Mills also includes providing an additional $3 million to support additional worker training, such as team-building skills, information systems, joint labor/management skills plus the rebuilding of the Malden Mills training facility. This public support enabled a thriving and important company in the Merrimack Valley to rebound after its devastating fire and continue to fuel that region's economic growth, providing jobs to over 2,000 workers.

CBWL will use these programs as well as its several federally and privately funded projects that focus on incumbent workers to help form and support public policy in this area. In particular, we will work with policy makers' efforts to increase investment in worker training and reduce the barriers to successful implementation of firm-based training projects. In support of this goal, CBWL has received $105,000 from the National Governor's Association to build an innovative state infrastructure to promote and facilitate business investment in worker training, which, in addition to such ongoing efforts as the Partnership for a Smarter Workforce, described elsewhere, will deepen our collective understanding of how to make incumbent worker training more effective and more common.

D. Protecting the Massachusetts Manufacturing Base

Throughout the manufacturing base in Massachusetts, the challenges of the new economy continue to reverberate at the firm level. The sector's modest gains made only in the late stages of this expansion underscore the difficulties experienced by manufacturers. Massachusetts policy makers have recognized the need to ensure the continued vitality of this sector, and created resources dedicated to their well-being. These resources represent significant funding commitments that leverage even more federal and private funds.

1. The Massachusetts Manufacturing Partnership

The Massachusetts Manufacturing Partnership (MMP), a manufacturing extension service of CBWL is a partnership supported by the National Institute Standards and Technology (NIST), the Commonwealth of Massachusetts through the Department of Economic Development's Office of Business Development and the private sector manufacturers. Through its five regional centers, each headed by a board representing local manufacturing concerns, MMP has provided manufacturing extension services to small and medium sized manufacturers since 1994. The services serve to increase quality, streamline processes, and strengthen employee performance.

Between February, 1994 and October of 1997, The MMP completed 862 in-depth technical assistance projects out of a total of 1,320 initiated, serving 753 manufacturing firms. MMP clients realized $3.328 million in cost saving and $16.096 million in increased sales. The return on the effort realized by these firms vividly illustrates the amount of private resources that are leveraged and brought to Massachusetts. NIST has favorably reviewed the performance and committed to funding MMP for three more years, subject to continued favorable performance and state match.

2. Mutual Complementarities: Bay State Manufacturing Networks

Part of the transformation of the manufacturing sector is the recognition that businesses throughout the supply chain can benefit by creating long-term, cooperative and horizontal relationships with one another, even when they are nominally competitive. By forming a manufacturing network, companies create a cost-effective way to share knowledge, increase the benefits of industrial clusters, and address change. Companies that have formed these collaborative relationships have realized important gains in competing in the larger economy.

The Bay State Manufacturing Networks Program provides funding and technical assistance to create and enhance manufacturing networks. Networks share information, leverage resources, and work on joint projects with the goal of increasing business opportunities for member companies. More than 450 companies employing 40,000 workers belong to CBWL's twenty-two manufacturing networks.

3. The Trust

CBWL's financing service, known as The Trust, provides loans and loan guarantees to viable manufacturing and software firms that are unable to secure funding from a bank, which help companies stabilize, expand, leverage private funds and establish a relationship with a traditional lender. During FY '97, thirty-four companies received a

total of $5.5 million in working capital financing assistance from The Trust. Loans from The Trust helped retain over 1,600 manufacturing jobs, and created several hundred new jobs.

4. One Stop, Many Services

The Massachusetts Office for Business Development has created five regionally based facilities to help manufacturers and other businesses identify and secure the support resources located throughout the state's agencies and quasi-public agencies, as well as providing information on the myriad resources offered by the private sector. These resources range from bond and export financing, to site development and marketing support for a company's products. Services are available to companies in every stage of development. Staffed by professionals with expertise in a variety of areas, the offices ensure that business get whatever help they need to locate or expand in Massachusetts.

E. Bringing the Expansion to All of the State

The benefits of this expansion have not been uniformly distributed, of course. Rural and older urban areas continue to experience higher than average levels of unemployment, poverty, and high school dropouts. Rural areas are particularly vulnerable to skills gaps, as more qualified workers leave to pursue new opportunities, and remaining workers are not numerous enough to attract new firms. High levels of high school dropouts, over 8% in some rural areas, perpetuate the cycle of underemployment and disinvestment.

Older urban areas -as well as a number of rural communities- add distressed real estate to this list. These properties can rarely be developed without protecting developers from potential environmental liability resulting from brownfield sites -buildings or properties that have some degree of hazardous contamination but are not so-called Superfund sites. Although brownfield re-investment has been a key strategy to addressing the problems of retaining the manufacturing base in older cities, the risk of liability effectively prohibits the private sector led investment. As a result, the efforts led by the Department of Economic Development have been muted, and the potential for development and economic gains unrealized. A number of policy makers continue to press for adopting policies to leverage more private investment and create and protect jobs for non-college educated citizens.

With the enactment of the Economic Revitalization Act of 1993, the state codified the policy objective to stimulate job creation in distressed areas, attract new businesses, and encourage existing businesses to expand. The new law launched the Massachusetts Economic Development Incentive Program (EDIP), which has been an engine for creating new jobs, leveraging investment and protecting existing jobs and companies, primarily in areas that are

distressed. Included in the law are incentives to use and develop abandoned buildings.

1. The Economic Assistance Coordinating Council

As part of the EDIP, the directors of Department of Economic Development and the Department of Housing and Community Development have led the eleven member Economic Assistance Coordinating Council (EACC), which reviews, coordinates and implements the policy goals of the EDIP. Members of the EACC meet monthly to identify needs and opportunities and to review applications for industrial development projects. To date, the EACC has approved 280 certified projects - projects that create net new jobs in the state and are located in a designated area of economic need- and four "Exceptional Opportunities" -a business that is either adding at least 100 new permanent full-time jobs or increasing its employment base by 50% or more. Among other things, these certifications qualify the applying company for specific tax relief, including a 5% State Investment Tax Credit for tangible, depreciable investments and tax packages from the host municipality. These projects have created a total of 21,339 new jobs and retained 36,335 jobs. The projects have leveraged over $2.46 billion in private investment.

2. MassDevelopment- The Massachusetts Development Finance Agency

In addition to the efforts of the EACC to spur development in economically underperforming areas, the state's real estate investment bank, the Massachusetts Development Finance Agency (MassDevelopment), works to support firms locating or expanding in Economic Target Areas. The support ranges from pre-development assistance of all types, to concentrated financing and technical support for large scale real estate development. MassDevelopment also provides a variety of financial products for its customers, and works closely cities and towns seeking to improve use of distressed properties.

F. Welfare Reform

Almost two years before the Congress and the Clinton Administration eliminated Aid to Families with Dependent Children, the Massachusetts Legislature and the Weld/Celluci Administration had recognized the problems inherent in that system and had enacted legislation to remedy them. The legislation seeks to encourage work using a variety of incentives, and it limits eligibility of an able-bodied parent to twenty-four months, subject to certain limited exceptions. For parents of school-age children, recipients must work or perform community service twenty hours a week to maintain benefits.

This new policy, aided by the strong economy, has produced the desired effects. Approximately 102,000 families were receiving AFDC benefits when the law was enacted. Some 73,000 families receive welfare payments today. About half of the remaining families are subject to the pending time limit. For those subject to the work requirement (i.e., those whose youngest child has reached school age), 44% are working in paid positions and 28% are working in community service positions.

1. Supporting Work and Creating Success

To help those families that remain and have very serious problems, Massachusetts and the U.S. Department of Labor are funding a program for welfare recipients identified as least likely to succeed under welfare reform. In particular, participants must have at least two of three characteristics: no high school diploma, history of drug addiction and lack of work experience. Massachusetts and its substate regions will receive approximately $40 million over a two year period from the federal government, to which the state is expected to contribute an additional $20 million. The program works primarily with individuals who have obtained employment or need short term work preparation services, and/or with their employers. The objective is to ensure that the transition to employment is successful.

2. Getting Welfare Moms to the Job

One of the most challenging barriers facing the parents who are subject to the work requirement is getting to the new job. According to the Department of Transitional Assistance (DTA), only about 6% of welfare recipients own an automobile, while more than two thirds of Massachusetts employers are beyond walking distance from a public transportation terminus, reflecting a system primarily designed to transport commuters to downtown locations. For individuals in rural communities, public transportation is usually even less useful. Although the DTA provides $90 a month for the transportation costs of certain individuals, a low-cost car costs about $.35 a mile to operate. For those who can get it, the subsidy thus covers about 270 miles of travel a month, or about twelve miles per working day. The problem is further complicated by child care needs, since a mother traveling long distances from her home via a multi-connection bus route cannot also get her child to a day care center unless it is either within walking distance from home or is at her work site. A sick child complicates the scenario still more.

The Executive Office of Transportation and Construction, together with almost all of the regional transit authorities, a number of non-profit local transport management associations and other common carriers, and the Department of Transitional Assistance are working together fashion locally oriented solutions to these issues. The projects, which are in rural areas, including Franklin County, Devens and greater Fitchburg, and

urban, including Lowell and Worcester, include redesigning routes and schedules to match labor market flows, fleet management with alternative carriers, placing child care facilities in intermodal transportation centers, creating van pools, and integrating child care facilities into bus routes. New technologies have made things like flexible routes and just-in-time models feasible. Much innovation has come simply through new communication channels established between welfare, training and child care agencies and area transit agencies.

XV. Recommendations for Future Policies: Stewardship and Investment

The strength of the current economy is built on change, renewal and the abilities of the workforce. It is no accident that successful investors, owners and managers of the firms, and their business customers focus on developing strategies to adopt and utilize new technology, new production methods, new work organizational structures, and new skill sets. These are the characteristics of success, and they have been rewarded accordingly.

In order to protect, support and cultivate the current growth as well as address the widening income gap, policy makers should consider the following recommendations in four broad categories. Within those categories that relate directly to our programmatic responsibilities, we have also provided specific action items that will support our ability to conduct discharge responsibilities.

A. Increase the Investment in Skills At *All* Levels

First and foremost, we urge continued and increased support for skills and knowledge acquisition of workers as a vital component to the competitiveness of all sectors of the economy and for the prosperity of the workers themselves. We believe that the workforce of the 21st century will continue to need ever higher skill levels as well as the ability to address change competently. We also observe that individual workers will experience many job and career changes, and they will need to be prepared to meet those challenges. The transience of workers need not be feared. The gift of diversity is that workers who are skilled and able to communicate well can be agents of progress and innovations.

The need is greatest for those whose skills are inadequate to participate in a full employment economy. The pay differential between the college educated and those without and the current unemployment levels of those with only a high school diploma or less speaks directly to the need to target the low-skilled aggressively to provide them with the opportunity to share in Massachusetts' prosperity. Efforts to do so will provide opportunities to the workers and will help employers to grow in the expanding market.

Specifically with respect to skills and access to education, we recommend the policy makers pursue three basic objectives:

Action Item: Provide the Necessary Resources to Eliminate Waiting Lists for Adult Basic Education

With 20% of adults reading at the fifth grade level, and 44% not able to use high school level math or English competently, the Massachusetts economy is working with one hand tied behind its back. The demands of the workplace have increased and will continue to increase, and the starting point for successful participation in the economy is almost universally high school level English and math (among other basic skills). The increasing reliance on workers new to this country makes the need even more urgent. In one respect it is encouraging that as many as 15,000 people sit on waiting lists for Adult Basic Education, because it indicates that workers recognize their own need to keep pace. They should not be turned away.

Action Item: Lower the Costs of Attending Community College and Expand Resources for Workers

The cost of attending a community college in Massachusetts, the third highest in the country, effectively prevents large numbers of Massachusetts current and future workers from investing in their own educations. Community colleges meet a vital need in the economy for workers and students seeking to be adequately prepared for the future. Community college is also typically attended by those who have little or no other means to accomplish their goals. Students will invest a substantial amount of time, energy and personal resources toward an education, but only if they can afford the up-front costs. That self-investment should not be financially prohibitive.

Massachusetts should reduce the financial barrier and make community college attendance more affordable. The number of complex issues relating to tuition and fees for day and night students will require significant amount of care and attention before specific strategies can be adopted. However, the ultimate goal should be to increase the number of students attending and expand the number of opportunities for recent high school graduates and full time workers to advance their education objectives.

Action Item: Encourage and Support Employer Investment in Worker Skills

Public support for increasing the skills of the currently employed constitutes a strategic policy decision to promote a workforce that is responsive to an ever changing economy. In a world where no employer can offer true employment security, workers need to be

prepared for new opportunities before a crisis occurs. Employers also need to be able to rely on highly skilled and adaptive workers to satisfy the needs of their markets. Our experience teaches that small and medium sized firms face a number of barriers that complicate the obvious problem of funding training.

Our recommendation for helping employers train their workers is twofold. First, we suggest continuing and increasing the financial commitment to employed worker training programs. These programs have made important contributions to the competitiveness of Massachusetts firms and are vitally linked to other industrial development programs. Second, we ask that policy makers pay close attention in the months ahead to the lessons learned on the part of employers and program providers in this area. In particular, we anticipate gaining a great deal of information on how employers organize, develop and deliver training for workers at all skill levels, ranging from low skilled recent welfare recipients, to highly skilled production workers. We will share the fruits of our efforts widely, which we hope will be highly useful in forming policy to further encourage employer led and publicly supported training programs.

B. Support Manufacturers' Deployment of Technology and Their Access to Capital

Our second set of recommendations concerns continued public support for the state's manufacturers. The manufacturing sector increased employment last year by the most number of new jobs in over twelve years, and it continues to be a vibrant and wealth producing sector. Policies should reflect support for continued sectoral growth and new product development. Accordingly, we make the following recommendations:

Action Item: Support Manufacturing Extension Programs.

Manufacturing extension services encourage the deployment of technology and workplace management tools and ensure that more firms realize their potential in the marketplace. The knowledge that is developed at larger firms can be captured and shared with smaller firms to the advantage of all. While cost barriers often make this function impossible for the private sector, public sector support can dramatically increase social returns in the form of greater prosperity, higher level skills and increased competitiveness in the larger national and world economy.

Massachusetts currently has three manufacturing extension services: the Bay State Manufacturing Networks, which support intra-sector, cross-sector and focused need networks; the Office of Technical Assistance for Toxic Use Reduction at the Executive Office of Environmental Affairs, which provides manufacturers with technical assistance to reduce source use of toxins; and the Massachusetts Manufacturing Partnership, which

introduces state of the market technologies and production methodologies to small and medium sized manufacturers. Each of these plays a unique and important role in translating the important gains in productivity and technology into applied industrial arts of small and medium sized firms. They also work closely together in a number of settings to optimize the contributions of each. Their efforts to help technological advances cascade down through the entire manufacturing base in the state are also closely linked to improving worker skills. As workers increase their skill levels and become more proficient, their employers can make higher use of the available technology. Similarly, as technology advances enter the production process, skills must be added to ensure effective deployment.

Massachusetts has created an important resource in the Massachusetts Manufacturing Partnership, which is part of a national network of manufacturing extension programs. The National Institute of Standards and Technology has committed to funding the MMP for an additional three years, contingent on continued favorable performance and state match. We strongly urge policy makers to support full funding for the MMP, which complements and enhances the work of the state's training efforts and other extension services. Without the appropriation of the state match, the opportunity to support manufacturers will be squandered.

Action Item: Support Continued Funding for Capital Access Programs for Manufacturers.

Access to capital continues to be important issue facing smaller manufacturers, and the public sector can play an important role in filling those gaps. The Mass. Office of Business Development creation of one stop business centers takes an important steps to coordinate existing programs, which ensure that programs are utilized to their greatest potential in attracting, building and retaining manufacturers. We recommend continued support for funding and coordinating capital access programs, particularly for working capital resources. Working capital is the beating heart of a business. The inability to obtain that type of financing is a recurring problem for small manufacturing concerns that stymies their chances for success.

C. Promote Investment in Older Cities with Brownfield Liability Relief

Third, more attention and investment in older cities and economic target areas is a low cost strategy with environmental and social benefits. These areas, which are often strongholds of the state's manufacturing base, are being left behind the economic recovery creating deeper poverty and ominous problems for the future. They are also extraordinary pockets of economic potential. Because of their concentrations of underutilized workers *and* property, they represent one of the

few viable ways to sustain growth and avert closing down the expansion. Their existing infrastructure investment also help urban areas provide high returns on new development, and do not create the transportation challenges inherent in off-highway suburban office parks. However, the current state of the law inhibits productive use of the brownfields. We urge concerted and determined efforts to encourage greater private investment in these areas, as well as continuing support for the efforts of the Economic Assistance Coordinating Council. This effort will complement and support education and training programs by bringing jobs to communities with high unemployment and offering Massachusetts firms places to grow.

D. Continue Commitment to Education Reform; Support At-Risk Youth

Fourth, the gains of Education Reform should be maintained overall and extended more aggressively to at-risk youths, who may otherwise not be able to contribute to the economy or support their future families. Although Massachusetts has improved its rate of graduating youth from high school, four percent leave school each year statewide, with over thirty high schools losing over seven percent each year. This adds up to almost 10,000 young people a year. The cost of losing so many talented and promising youth is incalculable, but considerably higher than the cost of better serving them while they are at risk.

The state's commitment to fully fund the Education Reform Act is both extraordinary and laudable. We recommend that policy makers build on that commitment and pay particular attention to the goals of integrating all parts of the youth development system into a coherent whole. The Center for Youth Development and Education (CYDE) has initiated and managed a number of innovative efforts described above that help communities and schools work together and increase the support and education for our at-risk youth. We recommend considering two additional strategies to protect at risk youth from uncertain futures.

Action Item: Support and Engage the Statewide Steering Committee on At-risk Youth

The Massachusetts Office of School to Work and CYDE has convened a permanent statewide Steering Committee for At-Risk and Out of School Youth. The mission of the Steering Committee is to help improve the outcomes for at-risk and out of school youth by uniting relevant state agencies and local stakeholders so that services are effectively coordinate and delivered. The Committee will advocate for at-risk youth, identify and describe best practices for serving their needs, support state and local activities to build better systems for these youth. We urge policy makers to support and become involved in the Steering Committee's activities. Much of the work of the Committee will be to focus on increasing the knowledge base and disseminate information on issues that relate to developing at-risk youth programming. Policy makers can play a valuable role by

committing to working on issues relating to this population and becoming active in supporting the work on their behalf.

Action Item: Increase Funding for the Massachusetts Dual Enrollment Plan

The Education Reform Act allows high school students with strong grades and the recommendation of the high school principal or guidance counselor to enroll in any of the state institutions of higher education to take college level coursework not available at their high schools. Qualifying juniors and seniors may take regular, non-remedial courses and apply the credits earned toward both a high school diploma and a college degree.

Funds for this program are limited and are awarded on a first-come, first-served basis. This queuing system has placed students enrolled in alternative programs, which are typically understaffed and underfunded, at a significant disadvantage to their peers enrolled in more affluent districts. By way of illustration, only 25% of applicants approved by the Department of Education were placed on a waiting list for Fall, 1997, while 40% of the applicants approved for Bunker Hill Community College had to be placed on waiting lists. That list included substantially more at-risk and disadvantaged youth.

We recommend creating a separate resource targeted at high achieving but at-risk and low income youth. The educational advantages of the dual enrollment system should accrue to students coming from disadvantaged backgrounds and alternative high schools as much as to other students. The goal of the Dual Enrollment system is to provide support to the state's brightest and most ambitious students. Despite their often troubled home and social circumstances, students enrolled in alternative high schools frequently meet those criteria and deserve the special opportunities Dual Enrollment provides. While the amount of funds needed are modest at about $400,000, the benefits to this population are high. The current waiting lists effectively prevent qualified students from participating. Eliminating the waiting list for this population will greatly encourage the students, complement their high school experience, and provide them with needed help to increase their educational goals.

XVI. Conclusion

Massachusetts continues to rank among the nation's top economic performers, supporting the third highest income *per capita* in the country. Its depth of institutional and intellectual resources, its leading edge base of technologically advanced producers, its control of an enormous set of financial assets, and its wealth of skilled and educated workers combine to make

it an economic powerhouse in the U.S. and the world. As the recovery matures, we would expect growth patterns to level somewhat, but the complexity and diversity of the elements that comprise the economy may help to shield the state from the painful downturn that ended the expansion of the Miracle years.

If an analysis of the new economy made by some leading economists –including Federal Reserve Bank Board chairman Alan Greenspan- holds true, that is, if inflation continues to be held in check by globalization and the increasing agility of capital and markets, a declining federal deficit, and by limited wage increases resulting from generalized worker insecurity, and if industries increase their profits or market shares by increasing productivity and product enhancing innovations, another possible scenario emerges: Rather than the inevitable downturn and recession that normally characterizes the end of a recovery, some economists believe that the new economy may limit the definitively up or down nature of the normal business cycle. This theory suggests that the conditions of the new economy can both keep inflation in abeyance, thus checking the Federal Reserve's need to raise interest rates to limit inflationary pressures, and maintain an acceptable level of firm profits to encourage further investment. Apart from all the factors listed above, the central basis cited for this possibility lies in the productivity growth driven by technological advances in production and communication technologies. Of course, the other possibility recognized by Mr. Greenspan and other key decision makers is that the business cycle is now in a period of increase, and the end of the cycle will initiate a period of contraction.

In either event, we know that Massachusetts policy makers remain interested in protecting and supporting the state's economic fortunes and helping individuals and communities who are being left behind in this age of prosperity and innovation. As program providers, we have reviewed the state of the Massachusetts economy with an eye toward identifying and describing both the economy overall as well as the existing need for the types of programs that advance policy makers' core objectives. We have also described some of the essential parameters of those programs. Whether this is a period representing an unprecedented span of uninterrupted economic growth (and threatening some common assumptions about economics in the bargain), or is instead simply a point in time approaching the end of a long and interesting expansion, history will certainly have an easier time deciding than we would. Instead, we will conclude with two fundamental and closely related observations applicable to both scenarios.

First, current public policy reflects the basic recognition that our general economic well being relies on the competitiveness of Massachusetts' firms and workers, and that this competitiveness is in turn based on a number of advantages residence in Massachusetts confers. To re-remark on just a few, we note the quantity and quality of public and privately funded research and development, the state's overall fiscal stability, the proximity to a highly able financial and service sector, the general level of worker education, and the specific base of expertise and skills residing in firms throughout the state. We note the successful efforts to lower the cost of doing business in the state and improve our competitiveness relative to the rest of the nation through

manufacturing extension programs, worker training programs, capital access programs and education reform. We believe that the policies underlying these efforts are sound and prudent, and we strongly encourage their continuation. Maintaining a strong and productive industrial base will benefit all citizens and help protect the future in all events.

Second, the growing gap between citizens at the lowest income levels and those who are at the mean or above is as unsurprising as it is unsettling. Just as this economy rewards workers with education and advanced skills, it essentially penalizes those without a basic education. Efforts to increase access to adult basic education and to community college education and to improve the performance of our public schools are a necessary step toward ensuring that the opportunities in an expanding economy reach a greater number of citizens. We also note that individuals without any post-secondary education present the only real slack in the labor market, and that these workers (or potential workers) can help firms grow in the years ahead if they are given the opportunity. Alternatively, if these residents are not supported in the best of times, they have even less chance for success in the event of a downturn.

Irrespective of the future of this expansion, these two observations can be taken as a whole in the context of Massachusetts' economic history. Over the course of its history, Massachusetts and its citizenry have consistently looked at the future with an eye toward protecting its existing assets and helping its least fortunate. Whether it be our universities, our public schools, our hospitals and researchers or our community-based organizations, we have historically found a way to make a whole that is far greater than the sum of its parts. That is the case today. Through careful stewardship over the conditions in which firms and their employees make their way, and by increasing the availability of educational and economic opportunities for the less fortunate, we can expect that it will be the case tomorrow as well.